

A CULTURALLY EMPOWERING PERSPECTIVE OF AFRICAN-AMERICAN PARENTS'
AND THEIR ADOLESCENT DAUGHTERS' HPV VACCINE ACCEPTANCE

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ABSTRACT

Kayoll Veronique Galbraith: A Culturally Empowering Perspective of African-American Parents' and their Adolescent Daughters' HPV Vaccine Acceptance
(Under the direction of Coretta Jenerette)

The human papillomavirus (HPV) vaccination literature supports the role of culture on African-Americans' HPV vaccination acceptance. However, the evidence supporting the role of culture on this health behavior is limited. Few studies examine the influence of culture on HPV vaccination acceptance among African-Americans using theoretical frameworks grounded in culture, and few studies examine the influence of culture from the perspective of adolescent females. Therefore, using a dyadic approach, this dissertation explored the role of culture on African-American parents' and their adolescent daughters' (12 to 17 years old) HPV vaccination acceptance using both the PEN-3 cultural model and the Health Belief Model. Grounded theory techniques and quantitative descriptive statistics were used to explore the cultural factors that influence the HPV vaccine acceptance of 29 African-American parent-daughter dyads ($n = 30$ parents; $n = 34$ daughters) residing in the Southeastern and Northeastern United States.

This dissertation's findings provide evidence of the role of culture on African-American parents' and their adolescent daughters' HPV vaccine acceptance, and suggest the need for future research to use a culturally empowering lens to better understand African-American parents' and adolescent daughters' cervical cancer prevention health behaviors. Additionally, the findings support the usefulness of using a culture-centered theory to explore culture-related factors that influence the HPV vaccine acceptance of African-American parents and daughters. Incorporating a dyadic approach was also useful for understanding how cultural factors that influence African-

American parents' and daughters' perceptions and health behaviors may be transmitted among families, kinship networks, and the community. The findings from this dissertation elucidate new areas that may potentially inform the development of culturally appropriate interventions to advance the field of cervical cancer prevention research.

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LIST OF ABBREVIATIONS

ACIP	Advisory Committee on Immunization Practices
CHAMP	Child Health Assessment and Monitoring Program
χ^2	Chi Squared Test
DTAP	Diphtheria, Tetanus and Pertussis
FET	Fisher's Exact Test
OB/GYN	Obstetrics and Gynecology
HBM	Health Belief Model
HCP(s)	Health Care Provider(s)
HPV	Human papillomavirus
NC	North Carolina
PEN	Perceptions, Enablers, Nurturers
SES	Socio-Economic Status
STD(s)	Sexually Transmitted Disease(s)
STI(s)	Sexually Transmitted Infection(s)
US	United States

CHAPTER 1: INTRODUCTION

Statement of the Problem

Since the 1940's, cervical cancer has been a major cause of death among women in the United States (US) (National Institutes of Health, 2010). In response to this, the Papanicolaou smear was introduced in the 1950s as a cervical cancer screening test, resulting in significant decreases in cervical cancer deaths in the U.S. by more than 60% between 1955-1992 (National Cancer Institute (NCI), 2013; (National Women's Health Network, 2015). Yet this success has only been to a certain extent. Although African-American women are among those with the highest cervical cancer screening rates, African-American women still have the highest cervical cancer mortality rate (4.0 per 100,000 persons) compared to Hispanic and non-Hispanic white women (2.7 deaths per 100,000 persons, and 2.1 deaths per 100,000 persons, respectively (NCI, 2015).

The HPV vaccine is a recommended vaccine for adolescent females as a preventive measure for cervical cancer. There are three HPV vaccines licensed for use in the US. The most recent is a 9-valent vaccine that protects against the same low-risk and high-risk strains included in the HPV-4 vaccine (6,11,16, and 18), and protects against five other high-risk strains (31, 33, 45, 52, 58). However HPV vaccination among adolescent females lag behind other childhood recommended vaccines. The latest statistics report that HPV vaccination initiation rates among African-Americans (66.4%, respectively) are higher compared to non-Hispanic whites (56.1%), while HPV vaccination completion rates are lower among African-Americans (61.6%) compared to Latinas (72.8%), and non-Hispanic whites (70.6%), (Centers for Disease Control and

Prevention (CDC), 2015). Ultimately, the HPV vaccination coverage rate is well below the Healthy People 2020 three-dose coverage goal of 80% for adolescent females (CDC, 2015; HealthyPeople.gov, 2015). More research to increase HPV vaccination acceptance (initiation and completion) among African-Americans is needed.

The HPV vaccination literature supports the role of culture on African-Americans' HPV vaccination acceptance. However, the evidence in support of the role of culture on this health behavior is limited. Religion (Thompson, Arnold, & Notaro, 2011; Thompson, Arnold, & Notaro, 2012), social norms (Lechuga, Swain, & Weinhardt, 2011), mistrust of health care providers (HCP) and healthcare system (Bynum et al., 2012) are among those cultural factors previously identified. Although these factors have been identified as preventing African-Americans' HPV vaccination acceptance, these studies were lacking detail and were not specific to the culture of an African-American population. Also missing are perspectives among African-American adolescent population of those cultural factors relevant to HPV vaccination acceptance and their input into the design of a behavioral intervention that addresses their needs. This study will help to further understand the role of culture on African-American parents and daughters' HPV vaccination acceptance by comprehensively exploring its role among parents and daughters.

Conceptual Framework

The conceptual models that guided this dissertation are the PEN-3 cultural model (Airhihenbuwa, 1992) and Health Belief Model (HBM) (Rosenstock, 1990). The PEN-3 is a model for understanding the intersection of culture and health and is useful for understanding how culture influences HPV vaccine acceptance among African-American parents and adolescent females. Within this model, culture is defined as shared values, norms, and codes that collectively shape a group's beliefs, attitudes, and behavior through their interaction in and with

their environments (Airhihenbuwa, 1999). It centralizes culture in studying health beliefs, health behavior and health outcomes and also places culture at the center of developing, implementing, and evaluating public health interventions. The PEN-3 emphasizes the role of the collective (family, community) in influencing the individual's health experiences and health decisions (Iwelunmor, Newsome, & Airhihenbuwa, 2014). The model also takes into account the multiple factors that determine health status and identifies them into three domains: (1) Relationships and Expectations, (2) Cultural Empowerment, and (3) Cultural Identity. The PEN-3 is influenced by traditional health behavior theories such as the HBM (Rosenstock, Strecher, & Becker, 1988), Theory of Reasoned Action (Fishbein & Ajzen, 1974), and the PRECEDE-PROCEED framework (Green & Kreuter, 1999). The letters, P E N, are acronyms referring to constructs within three interrelated and intersecting domains of the model.

While there are three domains within the PEN-3, only the Relationships and Expectations and Cultural Empowerment domains were used to guide this study. These two domains are used during the assessment phase of a study to explore the factors that influence a population's health behavior change. On the other hand, the Cultural Identity domain is used during the intervention phase of a study to determine the best point of entry the intervention should be targeted; either at the level of Persons, Extended family members, or Neighborhoods. The Relationships and Expectations domain (Iwelunmor et al., 2014) examines the Perceptions, Enablers, and Nurturers that influence health behavior. Perceptions include knowledge, attitudes and beliefs that may prevent or promote performing a health behavior. Enablers are community or structural factors that prevent or promote performing a health behavior. Nurturers are family or members of kinship networks who prevent or promote performing a health behavior. The Cultural Empowerment domain examines whether the constructs of the Relationships and Expectations

domain (Perceptions, Enablers, and Nurturers) are considered Positive, Exotic (or unique), or Negative. Beliefs or behaviors identified as positive promote a health behavior and should be viewed as an asset; beliefs or behaviors identified as exotic are not harmful and can be continued; and beliefs or behaviors identified as negative prevent performing a health behavior (Iwelunmor et al., 2014).

The HBM is a value expectancy model developed to predict people's decision to use preventive health behaviors (Becker & Maiman, 1975; Janz & Becker, 1984), and useful for understanding African-American parents' and daughters' HPV vaccine acceptance. The constructs of the HBM used in this study were perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. The model posits that individuals take preventive health action in response to a perceived level of threat (susceptibility and severity) if the benefits of the new behavior outweighs the barriers or cost of performing that new health behavior (Rosenstock, 1966). The other important constructs of the model that influences whether the individual engages in the new health behavior are cues to action and self-efficacy. Cues to action are factors motivate individuals to perform a new health behavior. Self-efficacy is the belief in one's ability to successfully perform a new behavior (Bandura, 1997). Hence, parents and daughters will accept the HPV vaccine if they perceive a threat is likely and severe, if they perceive HPV vaccination to be effective and safe, if they have a sufficient cue or motivation for vaccination, and if they believe they are able to obtain the HPV vaccine.

Together, the PEN-3 and HBM (Figure 1.1) may strengthen our understanding of the role of culture on African-American parents and daughters HPV vaccine acceptance by factors that are relevant to this population. Both the PEN-3 and HBM assess beliefs and cues to motivate health behavior engagement, however by using both the PEN-3 and HBM, we are able to assess

factors beyond the individual level into a broader socio-cultural context. The PEN-3 and HBM may produce a more meaningful set of factors to address diverse factors that influence African-American parents and daughters HPV vaccine acceptance (Bynum et al., 2012).

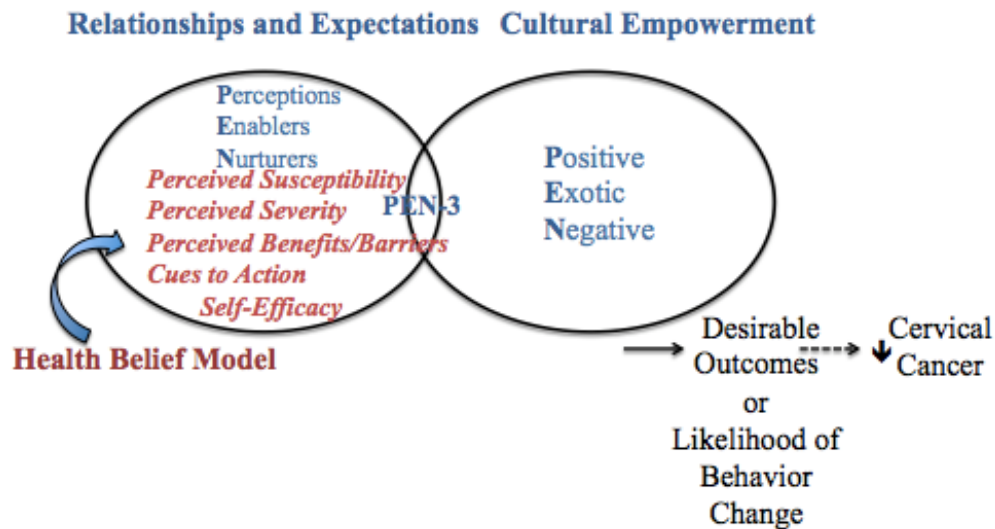


Figure 1.1. The PEN-3 cultural model and Health Belief Model. Source: Adapted from Scarinci, Bandura, Hidalgo, & Cherrington (2012).

Purpose

The purpose of this dissertation is to explore the role of culture on African-American parents and adolescent females ages 12 to 17 years old' HPV vaccine acceptance. This dissertation will use qualitative and quantitative methods to answer the following research questions:

- 1) What is the state of the literature on the role on African-Americans HPV vaccine acceptance?
- 2) How does culture influence African-American parents and adolescent females HPV vaccine acceptance?
- 3) What cultural factors influence African-American parents and adolescent females HPV vaccine acceptance?

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CHAPTER 2: PARENTAL ACCEPTANCE AND UPTAKE OF THE HPV VACCINE AMONG AFRICAN-AMERICANS AND LATINOS IN THE UNITED STATES: A LITERATURE REVIEW

Introduction

In the United States (US), it is estimated that 12,900 new cervical cancer cases occur and 4,100 result in death yearly (American Cancer Society (ACS), 2015). African-American women and Latinas have the highest cervical cancer incidence rates (9.2 and 9.9 new cases per 100,000 persons, respectively) compared to non-Hispanic white women (7.7 new cases per 100,000 persons). African-American women and Latinas also have a higher cervical cancer mortality rate (4.0 and 2.7 deaths per 100,000 persons, respectively) compared to non-Hispanic white women (2.1 deaths per 100,000 persons) (National Cancer Institute, 2015).

Historically, African-Americans have had the highest mortality rate and shortest survival rate for most cancers than any other racial and ethnic group in the US (ACS, 2013). Since 1975, African-American women have had the highest cervical cancer mortality rate compared to non-Hispanic white women (Tabatabai et al., 2014) and this trend continues today. One contributing factor to African-American women's high cervical cancer mortality rate is delayed diagnosis. Factors contributing to a delayed diagnosis among African-Americans include differences in the quality of screening and follow-up after abnormal results, and lower screening rates among African-Americans of low socioeconomic status (ACS, 2015). Although the overall five-year survival rate of cervical cancer is 91% when diagnosed at an early stage of the disease, only 39% of African-American women are diagnosed at such stage compared to 48% of non-Hispanic white women (ACS, 2015). This delay in diagnosis significantly decreases the overall five-year

survival rate of African-American women (ACS, 2013, 2015), making it lower (59%) than that of non-Hispanic white women (69%) (ACS, 2013).

Latinos, the fastest growing population in the US, have had the lowest mortality and incidence rates for all cancers combined compared to non-Hispanic whites (Ennis, Rios-Vargas, & Albert, 2011; Siegel, Naishadham, & Jemal, 2012). With regard to cervical cancer however, Latinas have the second highest cervical cancer mortality rate and are 64% more likely to be diagnosed with cervical cancer than non-Hispanic white women (ACS, 2012; Ennis et al., 2011). Similar to African-Americans, one contributing factor to Latinas' higher cervical cancer mortality rate is delayed diagnosis. Likewise, Latinas are also more likely to be diagnosed with cervical cancer at later stages of the disease (ACS, 2012).

Cervical cancer is caused by persistent infection with the Human Papillomavirus (HPV), which is the most common sexually transmitted infection (STI) in the US (Centers for Disease Control and Prevention (CDC), 2014; Walboomers et al., 1999). While cervical cancer is the most common HPV-associated cancer, HPV is also associated with other types of cancers (vulvar, vaginal, anal, penile, and oropharyngeal cancers), which result in disparities that extend to women and men of varied races and ethnicities. For example, more non-Hispanic white women get vulvar cancer than women of other races or ethnicities, and more African-American and non-Hispanic white men and women, respectively, get oropharyngeal cancer than Asian Pacific Islander and American Indian/Alaska Native men and women (CDC, 2012). Among African-Americans and Latinos, a greater proportion of African-American women and Latinas are diagnosed with vaginal cancers than non-Hispanic white women. Similarly, African-American men and Latinos have higher incidence rates of anal and penile cancers, respectively, than men of other races (CDC, 2012).

In 2006, a quadrivalent vaccine that protects against four types of HPV (6, 11, 16, 18), responsible for approximately 70% of cervical cancer cases (high risk strains) and 90% of genital warts cases (low risk strains), was licensed in the US. In 2014, a 9-valent (9vHPV) vaccine that protect against the four HPV types (6, 11, 16, 18) targeted in the quadrivalent vaccine plus five additional high risk types (31, 33, 45, 52, and 58) was also licensed (Joura et al., 2014). The 9vHPV vaccine offers the potential to increase overall prevention of cervical cancer from approximately 70% to approximately 90% (Serrano et al., 2012). The Advisory Committee on Immunization Practices (ACIP) recommends the HPV vaccines for routine administration for males and females ages 11 to 12. The ACIP also recommends catch-up vaccination to males ages 13 to 21 and females ages 13 to 26 (CDC, 2015a). The HPV vaccines are administered in a three-dose series at 0 month, 1-2 months and 6 months and research indicates that the vaccines are safe and effective (Garland et al., 2015; Joura et al., 2015; Markowitz et al., 2013; Stokley et al., 2014).

The most recent statistics for national HPV vaccination coverage among females, ages 13 to 17 years, indicates significant increases in coverage between 2013 and 2014. Coverage for ≥ 1 dose and ≥ 3 doses of the HPV vaccine for females increased from 56.7% and 36.8% in 2013 to 60% and 39.7% in 2014 (CDC, 2015b). Latinas and African-Americans now have higher initiation rates (66.3% and 66.4%, respectively) than non-Hispanic whites (56.1%). Completion rates for those who initiated the HPV vaccine are highest for Latinas (72.8%), followed by non-Hispanic whites (70.6%), and African-Americans (61.6%) (CDC, 2015b). These vaccination rates are promising considering that national HPV vaccination rates remained unchanged between 2011 and 2012 for females ages 13 to 17 years (CDC, 2013). Nevertheless, HPV vaccination rates are still below the rates of other childhood recommended vaccinations and

below the Healthy People 2020 three-dose HPV vaccination coverage goal of 80% for adolescent females (CDC, 2015b; HealthyPeople.gov, 2015).

The purpose of this systematic literature review is to condense the research findings of studies conducted with the two largest ethnic groups in the US: African-Americans and Latinos to understand factors associated with HPV vaccine acceptability and uptake among parents of adolescent females. Equally important, is understanding African-American and Latino parents' decisions to accept the HPV vaccine for adolescent males. However, this study focuses on African-American and Latino parents of adolescent females due to the increased availability of studies focused on this population as ACIP recommendations for routine administration of vaccination for males occurred years later (CDC, 2011). A review of the literature on parental HPV vaccine acceptance among African-American and Latinos is timely as it is imperative to provide direction to future HPV vaccine acceptability research and practice before current disparities in vaccination rates exacerbate existing disparities in cervical cancer incidence and mortality.

Methods

Standards for conducting an integrative review described by Whitemore and Knafl (2005) and Cooper (2009) were used. Studies in the following databases were searched: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PsycINFO. The inclusion criteria were: (1) studies that focused on African-Americans and/or Latinos in the U.S., (2) studies that examined attitudes, awareness, barriers, acceptability, knowledge, and perceptions related to HPV infection or the HPV vaccine, (3) studies that were published in peer reviewed journals, and (4) studies that consisted of samples composed of parents or caregivers of adolescent girls 9-17 years old. Exclusion criteria were: (1) studies that consisted of college women only, or adolescent girls without parents only, (2) studies that consisted of male

adolescents only, or male adults only, (3) studies that consisted of healthcare providers only, (4) reports that consisted of editorials, commentaries, dissertations, conference abstracts or literature reviews, and (5) studies that were duplicates. Studies were limited to African-American and Latino parents since these populations experience a greater burden of HPV-related cancers compared to non-Hispanic whites and since African-American adolescent females have below optimal HPV vaccine completion rates in comparison to non-Hispanic whites. Studies were limited to adolescent females and their parents given that, typically, it is the female parent of adolescent females who are the key decision makers for HPV vaccination at the optimal age of 11-12 years old (McRee, Reiter, & Brewer, 2010). Studies were also limited to U.S. population since the availability and policies governing the HPV vaccine differ from other parts of the world. For instance, the HPV vaccine was promptly available in the US after licensure but not in other parts of the world, and other industrialized countries now mandate the HPV vaccine, which is not the case in the US.

The same search terms were used in all three databases. Search terms were determined based on the focus of this review being on African-Americans, Latinos, parents, adolescents, and HPV. There was no time frame restriction on the search terms since the HPV vaccine has only been licensed in the US for the past 10 years and it was anticipated that the review would only include articles published within a 10 year time period. Hence, studies were searched through January 2015. The primary search term used was: “((hpv[Text Word] OR papillomavirus[Text Word]) AND vaccin*[Text Word]) AND (African American*[Text Word] OR Hispanic*[Text Word] OR Latina*[Text Word] OR Latino*[Text Word] OR Mexican*[Text Word]) AND (parent*[tw] OR mother*[tw] OR father*[tw] OR grandparent*[tw] OR grandmother*[tw] OR grandfather*[tw]).” After the initial search was conducted, the following search terms were

separately added to the primary search term: AND attitude*; aware*; AND knowl*; AND barrier*; AND perception*. The searches conducted in CINAHL were limited to exclude Medline records. The matrix method was used to examine and organize the studies included. The matrix method is an organizational tool to extract specified data for each subgroup classification (study design, theoretical framework, independent variables, dependent variables, etc.) for comparison on specific variables and sample characteristics (race/ethnicity, age, urban and rural, etc.) (Garrard, 2010; Whittemore & Knafl, 2005).

Results

Initially, 421 studies were retrieved from all three databases. Figure 1 presents the study screening process. Two hundred ninety nine studies were retrieved from PubMed, 27 studies were retrieved from CINAHL (excluding Medline records) and 95 studies were retrieved from PsycINFO. All 421 studies were transferred to Endnote, and then into Excel where they were reviewed based on the inclusion and exclusion criteria. Three hundred and ten duplicates were eliminated and 44 other studies were eliminated according to specific exclusion criteria described in Figure 1. A total of 354 studies were eliminated leaving 67 studies in this systematic literature review.

The majority of the studies in this review used a quantitative cross-sectional design ($n=36$) of telephone, web-based or in person surveys (Table 1). The other most frequent studies were of secondary analyses ($n=12$) of state surveys and a variety of national surveys. Eleven studies used a qualitative approach (Allen et al., 2012; Bair, Mays, Sturm, & Zimet, 2008; Hamlish, Clarke, & Alexander, 2012; Hughes, Jones, Feemster, & Fiks, 2011; Hull et al., 2014; Kepka, Coronado, Rodriguez, & Thompson, 2012; Luque, Raychowdhury, & Weaver, 2012; Morales-Campos, Markham, Peskin, & Fernandez, 2013; Perkins, Pierre-Joseph, Marquez, Iloka, & Clark, 2010; Sanders Thompson, Arnold, & Notaro, 2012). Four studies used both qualitative

and quantitative methods (Brawner et al., 2012; Constantine & Jerman, 2007; Getrich et al., 2014; Warner et al., 2014), and one study used a longitudinal cohort design (Fishman, Taylor, Kooker, & Frank, 2014). Five studies tested interventions (Brawner et al., 2012; Cox, Cox, Sturm, & Zimet, 2010; Kepka, Coronado, Rodriguez, & Thompson, 2011; Kepka, Coronado, et al., 2012; Lechuga, Swain, & Weinhardt, 2011).

All studies, except for 12, collected data from an urban setting (Cates, Brewer, Fazekas, Mitchell, & Smith, 2009; Fazekas, Brewer, & Smith, 2008; Kepka et al., 2011; Kepka, Ding, Bodson, Warner, & Mooney, 2015; Kepka, Warner, Kinney, Spigarelli, & Mooney, 2014; Kepka, Coronado, et al., 2012; Kepka, Ulrich, & Coronado, 2012; Lechuga et al., 2011; Luque et al., 2012; Thomas, Strickland, Diclemente, & Higgins, 2013; Thomas, Strickland, DiClemente, Higgins, & Haber, 2012). The sample sizes ranged from 17 mothers to 148,350 mother-daughter dyads derived from Kaiser Permanente California electronic medical record. Only 15 studies were conducted with Blacks or African-Americans (Allen et al., 2012; Blackman et al., 2013; Brawner et al., 2012; Cates et al., 2009; Fazekas et al., 2008; Fishman et al., 2014; Hamlish et al., 2012; Hughes et al., 2011; Hull et al., 2014; Joseph et al., 2012; Read, Joseph, Polishchuk, & Suss, 2010; Sanders Thompson et al., 2012; Thomas et al., 2013; Thomas et al., 2012; Thompson, Arnold, & Notaro, 2011), and sample composition ranged from 59% to 100%, of which, only eight used exclusively Black or African-American samples studies (Blackman et al., 2013; Brawner et al., 2012; Hamlish et al., 2012; Hull et al., 2014; Joseph et al., 2012; Sanders Thompson et al., 2012; Thomas et al., 2012; Thompson et al., 2011). Additionally, 26 studies had an all or predominantly Latino sample composition.

Among the 15 studies conducted with African-American samples, eight (~53%) used a quantitative cross-sectional design (Blackman et al., 2013; Cates et al., 2009; Fazekas et al.,

2008; Joseph et al., 2012; Read et al., 2010; Thomas et al., 2013; Thomas et al., 2012; Thompson et al., 2011), five (~33%) used a qualitative design (Allen et al., 2012; Hamlish et al., 2012; Hughes et al., 2011; Hull et al., 2014; Sanders Thompson et al., 2012), one (~7%) used a longitudinal design (Fishman et al., 2014), and one (~7%) used a quantitative and qualitative design (Brawner et al., 2012). The majority (~67%) of the studies did not report being informed by any theory, while five studies were informed by traditional health behavior theories, such as the Health Belief Model ($n=3$; 21%) (Fazekas et al., 2008; Joseph et al., 2012; Thomas et al., 2013; Thomas et al., 2012) and the Theory of Planned Behavior ($n=1$; 7%) (Brawner et al., 2012). Only one study (~7%) was informed by a combination of social science theories: the Dissemination of Innovation Theory and the Community Based Participatory Marketing Method (Hull et al., 2014).

Studies conducted with an all or predominantly Latino sample were 26 (Bair et al., 2008; Constantine & Jerman, 2007; Gerend, Zapata, & Reyes, 2013; Getrich et al., 2014; Kepka et al., 2011; Kepka et al., 2015; Kepka et al., 2014; Kepka, Coronado, et al., 2012; Kepka, Ulrich, et al., 2012; Lechuga et al., 2011; Lechuga, Vera-Cala, & Martinez-Donate, 2014; Luque et al., 2012; Middleman & Tung, 2010; Morales-Campos et al., 2013; Podolsky, Cremer, Atrio, Hochman, & Arslan, 2009; Ramirez, Jessop, Leader, & Crespo, 2014; Reimer, Houlihan, Gerrard, Deer, & Lund, 2013; Robitz et al., 2011; Sadigh, Dempsey, Ruffin, Resnicow, & Carlos, 2012; Sanderson et al., 2009; Savas, Fernandez, Jobe, & Carmack, 2012; Stevens, Caughy, Lee, Bishop, & Tiro, 2013; Warner et al., 2014; Watts et al., 2009; Wu, Porch, McWeeney, Ohman-Strickland, & Levine, 2010; Yeganeh, Curtis, & Kuo, 2010). Of these, 17 (~65%) were conducted with an exclusively Latino sample (Bair et al., 2008; Gerend et al., 2013; Kepka et al., 2011; Kepka et al., 2015; Kepka et al., 2014; Kepka, Coronado, et al., 2012;

Kepka, Ulrich, et al., 2012; Lechuga et al., 2014; Luque et al., 2012; Morales-Campos et al., 2013; Podolsky et al., 2009; Ramirez et al., 2014; Sanderson et al., 2009; Stevens et al., 2013; Warner et al., 2014; Wu et al., 2010; Yeganeh et al., 2010). Fifteen (~58%) consisted of quantitative surveys (Gerend et al., 2013; Kepka et al., 2015; Kepka et al., 2014; Kepka, Ulrich, et al., 2012; Lechuga et al., 2014; Middleman & Tung, 2010; Podolsky et al., 2009; Reimer et al., 2013; Robitz et al., 2011; Sanderson et al., 2009; Savas et al., 2012; Stevens et al., 2013; Watts et al., 2009; Wu et al., 2010; Yeganeh et al., 2010), five (~19%) were qualitative studies (Bair et al., 2008; Kepka, Coronado, et al., 2012; Luque et al., 2012; Morales-Campos et al., 2013), three (~12%) employed mixed methods (Constantine & Jerman, 2007; Getrich et al., 2014; Warner et al., 2014), one (~4%) was a secondary analysis (Sadigh et al., 2012), and two (~8%) tested educational interventions (Kepka et al., 2011; Kepka, Coronado, et al., 2012). Six studies (23%) were informed by traditional health behavior change theories (i.e., the health belief model and the theory of planned behavior) (Kepka, Ulrich, et al., 2012; Lechuga et al., 2011; Lechuga et al., 2014; Luque et al., 2012; Reimer et al., 2013; Warner et al., 2014) with the others not reporting use of any theory. Only one study (Lechuga et al., 2011) was informed by alternate theories, which consider the influence of culture-related factors. Only three studies were informed by the more expansive Social Ecological Framework (Kepka et al., 2014; Kepka, Ulrich, et al., 2012; Warner et al., 2014).

In the sections that follow, we present the findings of the systematic literature review in five themes: (1) Awareness and knowledge of HPV and the HPV vaccine, (2) HPV vaccination barriers, (3) HPV vaccine acceptability and intentions to vaccinate, (4) HPV vaccine uptake, and (5) HPV vaccine series completion (Table 2).

Awareness and Knowledge of HPV and the HPV Vaccine

Regarding awareness and knowledge pre-licensure, Bair et al. (2008) indicated that approximately 85% of Latina parents had not heard of HPV and were not aware of the HPV-cervical cancer link. Similarly, Fazekas et al. (2008) documented low awareness of the HPV vaccine (19%), and low correct knowledge of HPV (32%) in a sample of mostly African-American women from the rural south. Cates et al. (2009) corroborated these findings indicating low correct knowledge of HPV (29%) in a predominantly African-American sample.

Studies conducted post-licensure of the vaccine showed a reverse in the trend of low knowledge and awareness as is expected due to an increase in marketing campaigns promoting the HPV vaccine. Studies conducted with Latina mothers, who varied in SES, country of origin, urban versus rural residence, insurance, immigration status, and acculturation levels, indicated that knowledge and awareness levels ranged from moderate (43%) to high (80%) with levels becoming higher as years passed after licensure. By 2010, Wu et al. (2010) and Yeganeh et al. (2010) reported an awareness of HPV as high as 71% to 73%, with 58% being aware of the HPV-cervical cancer link. In a similar fashion, Hughes et al. (2009) found that compared to previous awareness and knowledge levels reported pre-licensure, HPV awareness and knowledge had increased greatly post-licensure in African-American parents. McRee et al. (2010) reported that 91% of parents had heard of the HPV vaccine and Allen et al. (2010) found that 88% of parents had heard about HPV and 65% about the HPV vaccine. However, even post-licensure, some studies composed of multi-ethnic samples reported that more Blacks (48%) and Latinas (39%) had never heard of the HPV vaccine than non-Hispanic Whites (25%) (Allen et al., 2010).

Importantly, among African-American and Latino parents, awareness and knowledge levels varied by socio-demographic characteristics. For example, in a cross-sectional survey of African-American male and female parents, HPV awareness was reported at 62% (Thompson et

al., 2011) and those who were aware of HPV were female, employed, had some years of college, an annual income \geq \$40,000, had a regular pediatrician, were younger than 41 years and had fewer children on average. HPV awareness in African-American women was also associated with a cervical cancer diagnosis. Those who were aware of HPV had either been diagnosed with HPV, cervical dysplasia or cervical cancer and 46% knew someone diagnosed with HPV or cervical cancer (Davlin, Berenson, & Rahman, 2015; Thompson et al., 2011). An analysis of the 2010 National Health Interview Survey revealed an HPV vaccine awareness of 62.6%, with parents more likely to have heard of the HPV vaccine if they were parents of older children, non-Hispanic white, female, insured, English speakers, born in the US, had higher income and had a well-child visit in the last 12 months (Wisk, Allchin, & Witt, 2014). A similar HPV awareness level of 66% was found in a study that examined information sources for the HPV vaccine among African-Americans and Latinos (Baldwin, Bruce, & Tiro, 2013). The study found that those who heard about the vaccine from their doctor were more likely to discuss it with close others compared to those who heard of it from media sources (Baldwin et al., 2013).

Among Latino parents, Gerend et al. (2013) assessed the influence of acculturation on knowledge. In this study, acculturation was defined as the rate at which Latino immigrants assimilate into U.S. mainstream American culture and was measured as English language competence, identity, and cultural competence. Findings indicated that Latina mothers who scored lower on English proficiency reported higher levels of knowledge compared to Latina mothers who scored higher on English proficiency. However, this finding was contradicted in a subsequent study, when, in 2014, Kepka et al. (2014) found that Latino parents who scored low on a English proficiency were 8.5 times more likely to report insufficient information including

that it consists of three doses. In this study, acculturation was also measured as English language competence.

HPV Vaccination Barriers

Among Latino parents, the most common vaccination barriers were concerns that vaccination may condone sexual activity in pre-adolescent children (Gerend et al., 2013; Kepka et al., 2015; Kepka et al., 2014; Kepka, Ulrich, et al., 2012; Luque et al., 2012; Morales-Campos et al., 2013; Ramirez et al., 2014; Warner et al., 2014; Wu et al., 2010), concerns about safety of the HPV vaccine, and low perceived risk of vaccine-eligible children contracting HPV (Gilkey et al., 2014; Watts et al., 2009; Wu et al., 2010). Among African-American parents, the most common vaccination barriers were concerns about safety of the HPV vaccine (Allen et al., 2012; Blackman et al., 2013; Brawner et al., 2012; Dorell et al., 2014; Hull et al., 2014; Rand et al., 2011; Sanders Thompson et al., 2012), sexuality-related concerns, which refers to concerns that HPV vaccination would lead daughters to engage in premarital sexual activity and give a false perception that parents condoned premarital sex (Allen et al., 2010; Brawner et al., 2012; Dorell et al., 2014; Dorell, Yankey, Santibanez, & Markowitz, 2011; Hull et al., 2014; Joseph et al., 2012), not having enough information about the vaccine (Allen et al., 2012; Guerry et al., 2011; Rand et al., 2011; Read et al., 2010), reporting not receiving a healthcare provider recommendation (Blackman et al., 2013; Guerry et al., 2011; Sanders Thompson et al., 2012), perception of hesitancy on behalf of a provider recommending the vaccine (Hughes et al., 2011), mistrust of pharmaceutical companies marketing the vaccine (Allen et al., 2012; Allen et al., 2010), and mistrust of medical providers (Allen et al., 2012). The other most common barriers to HPV vaccine acceptability among African-American parents were lack of knowledge about HPV (Dorell et al., 2011; Hamlish et al., 2012), perception that HPV vaccination is not needed (Dorell et al., 2014; Dorell et al., 2011), low perceived risk of daughter's acquiring HPV (Rand et al.,

2011), religion (religious denomination, frequency of religious service attendance) (Shelton, Snaveley, De Jesus, Othus, & Allen, 2013; Thomas et al., 2012), pragmatic barriers such as cost (Allen et al., 2010), and lack of time (Brawner et al., 2012), concern that vaccination may create a false sense of protection against all HPV strains associated with cervical cancer (Hamlisch et al., 2012), concern about effectiveness of the vaccine (Dorell et al., 2014), and concern about daughters being too young to be vaccinated (Hull et al., 2014).

HPV Vaccine Acceptability and Intentions to Vaccinate

As early as 2007, studies emerged indicating that Latina mothers are twice more likely to accept vaccination compared to other ethnicities (Constantine & Jerman, 2007). Subsequent studies, conducted pre and post-licensure, indicated that despite low knowledge of HPV and the HPV vaccine, acceptability ranged from 80% to 97% (Bair et al., 2008; Sanderson et al., 2009; Watts et al., 2009). Importantly, Sanderson et al. (2009) documented acceptance as high as 90% for daughters and sons among a sample of Latina mothers. However, Wu et al. (2010) was the exception reporting a lower acceptance rate of 64% among a group of Latina mothers with access to health care services. Among Latina mothers, reasons for vaccination acceptance were belief in the importance of adoption of preventive health measures and a preference to adopt preventive measures as early as possible to avoid regret, and general positive attitudes towards other vaccines, (Constantine & Jerman, 2007) perceived risk of daughters contracting HPV, beliefs in the importance of protection against diseases, and belief that the HPV vaccine is like any other vaccine that protects against disease (Bair et al., 2008; Sanderson et al., 2009; Wu et al., 2010).

Message framing and communication sources also influence HPV vaccine intentions to vaccinate. Cox et al. (2010) found that three different formats of presenting information (graphical HPV statistics, non-graphical HPV statistics and the presence or absence of a

rhetorical question) had positive effects on parents' intention to vaccinate their daughters. While, Casillas et al. (2011) reported that hearing about the HPV vaccine from a family or friend increased the odds for women perceiving the vaccine as effective compared to those who heard about the vaccine from a medical source.

Among African-American and Latino parents, intention to vaccinate was influenced by parental views on sexuality and daughters' risk for HPV, and by healthcare provider recommendations. Sadigh et al. (2012) indicated that Latino parents who conveyed acceptance of premarital sex among young adults were 2.45 times more likely to intend to vaccinate their children against HPV. A more recent publication (Lechuga et al., 2014) indicated that receiving a provider recommendation, worry about side-effects, believing that other parents have vaccinated their children, perceived severity of daughter contracting HPV, and worry that vaccination may encourage initiation of sexual relations emerged as significant predictors of intentions among Latino parents.

Among African-American parents, acceptance of the HPV vaccine varied more widely. African-American parents were motivated to accept HPV vaccination in anticipation of daughters sexual debut and to protect them from the stigma associated with contracting a sexually transmitted disease (Hamlisch et al., 2012; Perkins et al., 2010). A notable review of factors associated with HPV vaccination intentions among a sample of predominantly African-American women (Fazekas et al., 2008) revealed that 84% of women conveyed high intentions to vaccinate their adolescent daughters if the vaccine was free. Additionally, parents who knew more about HPV, had higher perceived risk of HPV infection and of cervical cancer, and higher perceived severity of being diagnosed with cervical cancer had higher intentions to vaccinate their daughters. Read et al. (2010) conducted a study with a primarily African-American sample

indicating that parents who were aware of HPV had 3.4 times greater odds of accepting the HPV vaccine for their daughters compared to parents who were unaware of HPV. Subsequent studies pointed to the importance of receiving a provider's recommendation (Hamlish et al., 2012; Joseph et al., 2012; Litton, Desmond, Gilliland, Huh, & Franklin, 2011; Thompson et al., 2011), social support for vaccination (Brawner et al., 2012) and perceiving the vaccine as having cancer prevention benefits (Hamlish et al., 2012; Perkins et al., 2010; Read et al., 2010).

Interestingly, religion emerged as significantly associated with acceptability among African-Americans. For example, Thomas et al. (2012) reported that non-Baptists were 3.6 times more likely to accept the HPV vaccine for their daughters compared to Baptists. Another study indicated that parents who had already vaccinated or intended to vaccinate their children were 2.7 times more likely to have a religious affiliation other than Baptist (Thomas et al., 2013). Shelton et al. (2013) also examined the influence of religion on HPV vaccine acceptance and found that parents with frequent religious services attendance were more likely to have decided against HPV vaccination than parents who did not attend services, and Protestant parents were more likely to report that they had not vaccinated compared to parents of non-protestant denominations (Shelton et al., 2013).

HPV Vaccine Uptake

Among Latino parents, vaccination rates have steadily increased post-licensure. In 2009, Watts et al. (2009) documented a vaccination rate of 26% in their sample of Latinas. Wu et al. (2010) documented a vaccination rate of 27% among uninsured Latina mothers with access to health care services. This study was the first to report associations between vaccination status and reasons for and against vaccination. Results indicated that knowledge of HPV was unrelated to vaccination status. However, mothers of unvaccinated daughters were 1.6 times more likely to convey sexuality related concerns while mothers of vaccinated daughters were 1.2 times more

likely to perceive their daughters as being at risk for HPV infection (Wu et al., 2010). Yeganeh et al. (2010) reported a vaccination rate of 37% among a predominantly medically underserved Latino sample (80% reported having a regular health care provider). The authors also report that 36% of these mothers had indicated they refused the HPV vaccine for their daughters. Regarding factors associated with vaccine uptake, results indicated that being Latino, belief in the effectiveness of the vaccine to prevent cervical cancer, and belief in the general safety of the vaccine emerged as predictors of vaccine uptake.

By 2012, studies continued to report low levels of vaccine uptake in Latina pre-adolescent daughters. Kepka, Ulrich, et al. (2012) reported a 35% vaccination initiation rate among primarily Spanish speaking Latina mothers living in a rural community. This study was the first to report a significant association between awareness of HPV and uptake. Among other predictors of uptake was the belief that the daughter's father approves of the daughter's vaccination and the belief that only one dose is necessary. The emergence of these two factors as significantly associated with uptake resulted from the authors' innovative use of the more expansive Social Ecological Framework of behavior change to inform survey content.

The first analysis of data from a large national survey, The 2006-2008 National Survey of Family Growth, was published in 2012 (Sadigh et al., 2012). Findings indicated a vaccination rate of 27% with families living below the poverty level being 4.43 times more likely to have initiated vaccination. Using a sample of low-income African-American and Latino parents who called a 2-1-1 Texas/United Way Helpline to receive information about cancer, Savas et al. (2012) documented a 29% vaccination rate. Factors associated with vaccination uptake were being Latino, receiving a doctor's recommendation to vaccinate, and belief in the effectiveness of the vaccine to prevent cervical cancer.

Tsui et al. (2013) examined how the geographic location of safety health clinics influenced HPV vaccine initiation rates among a sample of predominantly Latina mothers living in Los Angeles County. This was among the earliest study to examine access among a sample of Latina mothers (51.6%) who had previously heard of the HPV vaccine (60.7%). The study reported an HPV vaccine initiation rate of 25% for adolescent girls, and reported that having an increased proximity to clinics was not associated with HPV vaccine uptake. Instead, daughters' age and having insurance was associated with higher HPV vaccine uptake.

In 2013, Gerend et al. (2013) published a study, which incorporated sociocultural variables such as acculturation. Acculturation was measured as English language competence, identity, and cultural competence. In this study, only 18% of Latino parents reported initiating vaccination for their daughters. Variables independently associated with vaccination uptake were U.S. acculturation and a physician's recommendation. The acculturation scale used examined U.S. acculturation and native culture acculturation. Interestingly, only Latina mothers with higher levels of U.S. acculturation were more likely to have their daughters vaccinated with the HPV vaccine.

Reimer et al. (2013) study was the first to explore the influence of other sociocultural factors such as sexual activity and mother-daughter communication and the potential moderating influence of ethnicity. Results showed that vaccination uptake decreased by a factor of .77 when Latinas engaged in value-specific sexuality-related communication (in relation to moral, cultural, and religious values) and vaccination uptake increased a factor of 1.9 when non-Hispanic white mothers engaged in value-specific sexuality-related communication with their daughters. Across studies conducted with primarily African-American parents, Chao, Slezak, Coleman, and Jacobsen (2009) analyzed the electronic health records of mother-daughter pairs, who had

already initiated the HPV vaccine, and found that a mother's Pap test history was associated with their daughter's HPV vaccine initiation (odds ratio [OR] = 1.47; 95% confidence interval [CI] = 1.43, 1.52) regardless of race/ethnicity. Pap test history was defined as having no pap test or at least one pap test in the last three years.

Subsequently, several studies that examined HPV vaccine initiation rates among African-Americans within statewide samples were published. Reimer et al. (2013) examined HPV vaccine uptake correlates among parents of adolescent girls who completed the 2008 Child Health Assessment and Monitoring Program (CHAMP) survey for North Carolina and found that 31.3% of parents reported that their daughters had received at least 1 dose of the HPV vaccine. Cates et al. (2010) also analyzed this same 2008 CHAMP survey for the state of North Carolina and found a similar vaccine initiation rate of 31%. Forty six percent of those who had initiated the HPV vaccine reported to have heard about the HPV vaccine from a healthcare provider and that parents who had heard about the HPV vaccine from a healthcare provider were more likely to vaccinate.

Allen et al. (2010) analyzed data from a national survey of non-Hispanic white (48%), black (30%), and Hispanic (22%) parents to examine factors influencing their vaccination uptake for their daughters. Interestingly, regardless of awareness of the HPV vaccine, actual HPV vaccination rates were very low for all groups: non-Hispanic whites (12%), Blacks (11%) and Hispanics (15%). Similarly, Dorell et al. (2011) analyzed the National Immunization Survey Teens 2008 and 2009 and reported an HPV vaccine initiation rate of 42.5% and the strongest factor associated with HPV vaccine initiation was a provider recommendation, followed by girls being older, having an 11-12 year preventive visit, insurance status, and not receiving the HPV vaccine at a public facility. In other studies consisting of analysis of large national surveys, Lau,

Lin, and Flores (2012) documented a low HPV vaccine initiation rate of 20% for a pooled sample of non-Hispanic whites, Latinos, and African-Americans, with non-Hispanic whites having a higher HPV vaccine initiation rate (61%) compared to Latinos (16%), and African-Americans (15%). In this study, parental report of receiving a healthcare provider recommendation was associated with approximately 18 times the odds of initiating the HPV vaccine series. Laz, Rahman, and Berenson (2012) in a similar fashion continued to document a low overall HPV vaccine initiation rate (28.9%), with non-Hispanic whites (29.6%), Blacks (26.9%) and Hispanics (31.1%) having similarly low HPV vaccine initiation rates. The factors associated with vaccine initiation included having an influenza vaccine in the past year and parental awareness of the vaccine.

In 2013, Poloniyo and Carpiano (2013) also analyzed data from a large national survey. Their analysis was informed by the Fundamental Cause Theory, which posits that health disparities endure despite significant changes in diseases and risk factors associated with them because social conditions embody “an array of resources, such as money, knowledge, prestige, power, and beneficial social connections, that protect health no matter what mechanisms are relevant at any given time” (Phelan et al., 2010). Access to such resources affects people’s ability to avoid health risks and minimize the impact of diseases (Link & Phelan, 1996), and often times it is individuals from lower socioeconomic statuses with limited access to such resources in which diseases progress. The overall HPV vaccine initiation rate for the multi-ethnic pooled sample of White, Black, and Hispanic adolescent girls was 38.9%. This study found that girls in middle or low-income households had 25% lower odds of initiating the vaccine compared to girls from high-income households. Black adolescent girls had 22% lower odds of initiating the vaccine compared to non-Hispanic white adolescent girls. Additionally, the odds of receiving a

provider's recommendation for the HPV vaccine was significantly lower for black (27%) and Hispanic (14%) adolescent girls than non-Hispanic white adolescent girls (Polonijo & Carpio, 2013). All models controlled for child's age, mother's age and marital status, total children in household, adult respondent who provided the information, census region, and year of observation. In 2013, Kester, Zimet, Fortenberry, Kahn, and Shew (2013) documented an HPV vaccine initiation rate of slightly more than half (51.1%). Unlike the Polonijo and Carpio (2013) study however, socioeconomic and demographic factors were not associated with vaccine initiation. This difference may be related to mothers in Kester et al. (2013) being of a higher socioeconomic status and characterized as having some college education, working and married, and

HPV Vaccine Series Completion

Yeganeh et al. (2010) was the first and only study, to our knowledge, to report HPV vaccine completion rates in a sample of primarily Latina mothers. In this study, 37% of mothers reported initiating the vaccine for their daughters and of these, 43% and 26% reported that daughter had received two and three doses, respectively.

The earliest published study to document HPV vaccine completion rates in primarily African-American samples was published by Dorell et al. (2011). In this study, only 53.3% of the 40% of adolescent girls who had initiated the HPV vaccine completed the three dose series. Black and Hispanic adolescent girls were less likely to complete the series than non-Hispanic white adolescent girls. The HPV vaccine series completion rate for non-Hispanic whites (60.4%) was significantly higher than that of Blacks and Hispanics (46% and 40.3%, $p \leq 0.05$). Factors associated with HPV vaccine completion was being 16 years old, not being Black or Latino, and having a household income of 133% to < 322% of the Federal Poverty Level. Laz et al. (2012) indicated that of 28.9% who had initiated the vaccine, almost half (49%) completed the three

dose series. The study also documented that of those who initiated the vaccine, 16.1% of non-Hispanic white, 10.9% of black, and 12.3% of Latina adolescent girls had received 3 or more doses.

In 2013, Polonijo and Carpiano (2013) reported a completion rate of 21.7%. The study examined SES and race/ethnicity on HPV vaccine completion and reported a positive association between completion and higher maternal education. Also, adolescents in middle and low-income households had significantly lower odds (23% to 25%) of completing the series. Additionally, estimates for black adolescents indicated a 34% lower odd of completing the vaccination series, while the estimate for Latino adolescents was 13%. Kester et al. (2013) reported a similarly low HPV vaccine completion rate of 38.3%. In this study, black and Latina girls were also significantly less likely to complete the 3-dose series than non-Hispanic white girls.

Discussion

Epidemiological research provides evidence that overall cancer-related incidence has remained stable, and cancer-related mortality has in fact decreased, across ethnic groups in the US. However, when it comes to HPV-associated cancers, African-Americans and Latinos are disproportionately affected (Jemal et al., 2013). The unveiling of the HPV vaccine has been hailed as a remarkable public health achievement with the potential to considerably reduce disparities in HPV-associated cancers. Unfortunately, vaccination rates in adolescent girls are well-below the 70% vaccination completion rate needed to achieve herd immunity (Kim & Goldie, 2008). Importantly, there are large disparities in African-American adolescent girls HPV vaccination completion rates. Our literature review indicated that awareness about HPV and the HPV vaccine varies by demographic characteristics of African-American and Latino parental groups. In particular, there is an association between higher socioeconomic status and awareness among African-American parents and acculturation to U.S. culture and awareness among Latino

parents. However, findings were mixed regarding the direction of association between acculturation and knowledge among Latino parents. It is important to note that acculturation has been assessed primarily as English proficiency and English proficiency is strongly associated with socioeconomic status. It will be important to replicate research on acculturation to include other facets of acculturation such as ethnic identity and cultural knowledge for both U.S. and native culture as done by Gerend and colleagues (Gerend et al., 2013). It is important to note that awareness is not enough to motivate vaccination as findings from this review indicate that higher levels of awareness increased over time to a greater extent than actual vaccination rates. In addition, some studies reported finding no significant association. In fact, research has pointed to hesitancy to vaccinate among parents who are aware of the vaccine and the HPV-cervical cancer link. Notwithstanding the weak awareness/knowledge-uptake link, research has not explored why Latino and African American parents may be less aware/knowledgeable compared to other population groups. A possible explanation is lack of targeted communication campaigns in sources considered credible by Latino and African-American parents. For example, research documenting the credibility of specific sources has been sparse. Our review indicated that among Latinos, having heard about the HPV vaccine from health care providers increased uptake compared to learning about the vaccine from other sources. Recent research suggests that trust in information sources is an influential factor in parental vaccination yet this type of research has been sparse in the US (Yaquib, Castle-Clarke, Sevdalis, & Chataway, 2014).

Regarding barriers to vaccination, sexuality-related concerns emerged among both African-Americans and Latinos. Sexuality-related concerns among African-Americans and Latino parents included concerns that HPV vaccination may lead daughters to engage in premarital sex and provide a false perception that parents condoned premarital sexual activity.

This finding is in contrast with findings of research conducted with non-Hispanic white parents for whom sexuality-related concerns are low (Brewer et al., 2011; Marlow, Forster, Wardle, & Waller, 2009). This contrast in findings is important as it suggests other fruitful avenues of parental acceptability research to be pursued among African-Americans and Latinos. For example, few researchers have inquired in depth about the attitudes and values underlying sexuality-related concerns and how best to address them in public health interventions. Importantly, both African-Americans and Latinos share a culture of silence (an unspoken consensus of a group to not mention, discuss, or acknowledge a given subject) regarding sexuality-related communication within their family and community (Harris, 2010; Meneses, Orrell-Valente, Guendelman, Oman, & Irwin, 2006; West, 1993). Such culture of silence may underlie sexuality-related concerns. Importantly, continuing with research informed solely by prominent health behavior change theories which focus on rational decision making that is devoid of cultural context and centers on attitudes towards the vaccine itself may take researchers into an unfruitful path regarding the discovery of important factors to consider and address in interventions to promote child STI vaccines in African-American and Latino parents. Furthermore, low perceived risk of child contracting HPV also emerged as a shared barrier across both ethnic groups. Sexuality-related concerns may underpin low perceived risk of child contracting HPV. Low perceived risk of child contracting HPV may be closely associated with the belief that children for whom vaccination is currently recommended are too young to become sexually active and hence are at low risk. Furthermore, for African-American parents, religious beliefs may underpin sexuality-related concerns by promoting negative views about adolescent sexuality. These hypotheses need to be corroborated in future research and if so, interventions need to address sexuality-related concerns directly including educating parents about the low

probability rate that they will accurately predict the timing of their children's sexual debut by using evidence as a credible source.

Concerns about safety also emerged as a shared barrier for African-Americans and Latinos. The U.S. Latino population is a heterogeneous group regarding generational status, immigration patterns, country of origin, language, and ethnic identity. It is important to continue research with diverse segments of the U.S. Latino population. For example, vaccination mandates are well-regarded in Mexico by the general population. This may be the result of Mexico passing stringent vaccination mandates when vaccines first become available compared to other countries such as the US, which has one of the most liberal vaccination policies often provide support for attributions to the perceived incongruence between stringent mandates and respect for individual liberties. However, the extent to which this general positive attitude generalizes to Latinos born in other countries other than Mexico has not been adequately researched. In addition, the U.S. Latino population varies regarding generational status and U.S. born Latinos, who may be more acculturated to the U.S. culture and may hold different attitudes than those less acculturated. Acculturation has featured poorly in research on Latino parental HPV vaccine acceptability.

Other barriers cited by African-Americans may be closely associated with safety concerns, such as not having enough information, not receiving a provider recommendation or receiving a hesitant recommendation, mistrust of medical providers and pharmaceutical companies, and concern about effectiveness. The introduction of the HPV vaccine in the U.S. has been shrouded in controversy (Keelan, Pavri, Balakrishnan, & Wilson, 2010; Tozzi et al., 2010), which has created concern about safety (Wailoo, Livingston, Epstein, & Aronowitz, 2010). For example, U.S. Representative Michele Bachmann claimed that the government was forcing

innocent little girls to be subjected to HPV vaccination, a vaccine she linked to causing mental retardation (National Public Radio, 2011). This controversy may have been particularly salient for African-American parents whose experience with the healthcare system is often negative (Williams & Wyatt, 2015). To date, research on ethnic parental groups' acceptability of HPV vaccination has focused on elucidating the proportion of parents who convey safety concerns and the influence of such concerns on vaccination intentions and uptake. Little research has been conducted to elucidate beliefs and attitudes that may underpin such concerns such as mistrust of U.S. entities promoting the vaccine. As mentioned above, research in other countries is emerging indicating the important influence of trust in institutions that mandate health behaviors to promote the public's health on the adoption of health preventive behaviors, in particular vaccination (Yaqub et al., 2014). Researching institutional mistrust may be another fruitful avenue to pursue to inform the design of HPV vaccine promotion interventions targeting African-Americans in particular.

Regarding vaccination acceptance and intentions, studies with Latino parents revealed that acceptability is high and vaccination intentions associated with the vaccine's cancer preventive benefits, low perceived risk of negative side effects, believing that other parents are vaccinating their children (subjective norms), positive attitudes towards vaccines in general, perceived risk of daughter's acquiring HPV, acceptance of pre-marital sex, low worry that vaccination may encourage initiation of sexual relations, and receiving a provider's recommendation. These findings lend support to findings pointing to vaccination barriers. However, more research is needed to uncover which of these factors emerge as the most important in vaccination acceptance. Importantly, no research has addressed the potential interactive nature of predictors of vaccination intentions.

Interestingly, similar to review findings about awareness, the acceptability rate varied more widely among African-Americans compared to Latinos. Acceptance and intentions among African-Americans were associated with awareness of HPV, perceived risk of acquiring HPV and cancer, perceived severity of cervical cancer, receipt of a provider's recommendation, and not being affiliated to the Baptist religion. Among African-Americans in particular, religion emerged as distinct factor influencing their HPV vaccine acceptance and should be explored more in depth. Specifically, exploring the role of faith-based organizations in promoting HPV vaccination while remaining in concordance with religious doctrine. However, acceptability and intentions are imperfectly related to actual behavior. Consequently, our findings in predictors of vaccination uptake are especially important.

In terms of vaccination uptake, recent HPV vaccination coverage data indicates that differences in HPV vaccination uptake among African-American, Latina, and non-Hispanic white adolescent girls are steadily decreasing. However, HPV vaccination rates still remain below the rates of other childhood recommended vaccines. Importantly, considerable gaps remain in completion rates among African-American adolescent girls. Regarding specific predictors of uptake among Latino parents, belief in the effectiveness of the vaccine and safety, belief that father of the child approves of the vaccine, receiving a doctor's recommendation to vaccinate, U.S. acculturation, sexuality-related communication between mother and daughter, and norms are significantly associated with uptake. For African-Americans, mothers receiving a pap-test, being aware of the HPV vaccine, receiving a health care provider recommendation, daughter's age, daughter attending a preventative health care appointment, insurance, having received the influenza vaccine in the prior year, social support, and socioeconomic status were associated with vaccine uptake. Significant predictors of vaccination uptake mirrored the

predictors of intentions. This may be the result of researchers continuing to follow traditional health behavior change theories to inform uptake studies. However, important findings emerged that point to new research avenues. First, among Latino parents, the research findings regarding the link between knowledge and awareness of HPV and vaccination uptake remain mixed. Among African-Americans, the link between religion and HPV vaccine uptake also remain mixed. Results of studies documenting the influence of sociocultural variables rather than properties of the vaccine (e.g., effectiveness and side-effects) have shown interesting results pointing to the importance of context such as consideration of father of the child in the decision-making process, communication about sexuality between mothers and daughters, mistrust of healthcare providers and pharmaceutical companies, social support for vaccination and belief that members of one's social network have vaccinated (norms). These findings suggest that future research with Latinos and African-Americans need to expand on the role of sociocultural aspects and be informed by theories other than the prominent health behavior change theories. Interventions focusing only on changing attitudes towards safety and effectiveness are likely to be minimally effective if individuals are making vaccination decisions by considering other aspects as well.

For both African-Americans and Latinos, having received a health care provider's recommendation emerged as strongly associated with vaccine uptake. For Latina mothers, findings indicative of the influence of subjective norms further underscore the importance of a provider's recommendation because as more parents decide to vaccinate their children based on these recommendations, perceived social norms regarding parental behavior among the Latino community may change and contribute to further increase vaccine uptake. In addition, social network interventions to promote HPV vaccination among Latinas may be particularly effective.

Social network interventions to promote prevention for other sexually transmitted infections among Latinas have shown promise (Ramos, Ferreira-Pinto, Rusch, & Ramos, 2010; Ramos, Green, & Shulman, 2009). Similarly, social support networks are an integral part of African-American culture (McAdoo & Younge, 2008). Social support from network members was identified as influencing African-Americans' HPV vaccine acceptance. However, studies on the type of social support and the role of social support networks on African-Americans HPV vaccine acceptance are limited. It may be beneficial to examine the role of social support and social support networks on African-American parental HPV vaccine acceptance for future interventions targeted towards increasing HPV vaccine acceptance among this population.

For African-Americans, socio-demographic characteristics associated with uptake such as pap test history, having received the influenza vaccination, having had a well-child visit, insurance, and cost underscore the key role of the health care provider in recommending the vaccine during other preventative health care visits. Regarding vaccination completion, African-Americans are considerably lagging behind completion rates compared to non-Hispanic white parents. It may be useful to explore the benefits of children initiating HPV vaccination as toddlers and providing follow-up vaccinations across the lifespan.

Future Research

Current academic health promotion discourse (Pasick et al., 2009) points to the importance of expanding health behavior change theories to incorporate culture-related variables as these may play a more prominent role in behavior change decision-making when compared to person-centric variables such as attitudes toward the attributes of the behavior in question. Importantly, research indicates that sexuality-related concerns are prominent in parental acceptance of the HPV vaccine in ethnic populations yet little research has been conducted to understand the nature of such concerns. Future research could benefit by focusing on culture-

centered theories to unpackage sexuality-related normative concerns among African-Americans and Latinos to explore its connection to religion and other factors salient in these populations.

It is interesting to note that no studies included in this review, investigated factors associated with vaccinating sons. Research is certainly moving in this direction with publications increasing steadily after the ACIP approved the vaccine for males in 2009, albeit too few to warrant a review of the literature. The few existing studies on the topic indicate that a provider's recommendation also influence uptake and in the case of Latinos, Spanish-speaking Latinos convey greater intent to vaccinate boys compared to English-speaking Latinos (Reiter et al., 2014). This finding suggests that the time is ripe to conduct further research on culture-related factors associated with vaccination uptake for male children. In particular, what is it about the culture of origin in U.S. Latino immigrants that promote positive attitudes towards vaccines?

Furthermore, our review also pointed to the dearth of studies reporting on the development and testing of interventions to promote HPV vaccination among African-Americans and Latino parents. The few (five) intervention studies included in this review tested different risk presentation formats to increase HPV vaccine acceptance among a sample of ethnically diverse parents (Cox et al., 2010), tested radionovelas as a platform for increasing HPV vaccine uptake among Latinos (Kepka et al., 2011; Kepka, Coronado, et al., 2012), tested a gain versus loss message framing intervention among ethnically diverse parents (Lechuga et al., 2011), and tested a skills-based intervention to increase HPV vaccine uptake among African-American adolescents and their parents (Brawner et al., 2012). While only a few intervention studies were found in this review, it is encouraging that most of these studies used culturally tailored interventions targeting ethnic minorities, however, as our findings suggest, education may not be enough and other factors need to be considered. More culturally tailored and theory guided

intervention studies to increase HPV vaccine acceptance among African-American and Latino parents are needed.

Lastly, it is imperative that interventions be developed to also target HPV vaccination completion. Barriers to completion among the general population seem to center around logistical issues such as lack of reminder systems in clinics (Chao, Preciado, Slezak, & Xu, 2015), inadequate vaccine stock in health care settings given the high cost of the vaccine, (Brisson, Drolet, & Malagon, 2013) and once more the quality of a provider's recommendation. Completion is higher in patients who attend a pediatrics clinic compared to family or internal medicine or OB/GYN departments (Rubin, Kuttub, Rihani, & Reutzel, 2012). It may be important for future research to examine the meaning of a quality HCP HPV vaccine recommendation from the perspective of parents and adolescents. Even more, examining how the comfort level of HCPs vary by setting (pediatricians, OBGYN) may reveal important communication gap that exists among this group that can be incorporated in HPV vaccine interventions. Future research could also shed light on the approach taken by pediatricians and develop educational interventions to train other providers in the use of successful HPV vaccine promotion strategies. However, future studies should also attempt to corroborate that the abovementioned factors associated with completion rates generalize to ethnic minorities in addition to expanding to include other potential barriers.

Limitations

There are limitations to this systematic literature review. Characteristics of studies in this review included how closely the study objective was conceptually relevant to the review's objective and the racial/ethnic makeup of the study samples containing solely African-Americans or Latinos, or some combination of African-Americans, Latinos or non-Hispanic whites. Importantly, the studies in this review were selected based on their content instead of their

methodological rigor and reliability. Another limitation is that the designs of the studies in this review were primarily quantitative cross-sectional, secondary analyses or qualitative descriptive. These designs are low in the level of control that is exerted in the study. Therefore, further studies of more rigorous designs may be needed to prove causation (Brink & Wood, 1997). In addition, we describe the factors that have emerged as significantly associated with vaccination acceptance and uptake and we did not weigh which of these factors may be more important. Regardless of these limitations, this systematic literature review will help guide future research on HPV vaccine acceptability by providing confirmation and new findings about factors that should be included in the design of impactful interventions to promote the vaccine among African-Americans and Latinos. Failing to develop impactful interventions to reverse below optimal initiation and completion rates among these two groups will result in continued disparities and further suffering by African-Americans and Latinos from cervical cancer and other HPV-related cancers.

Conclusion

The disparity in HPV vaccination coverage among adolescent females is decreasing, as vaccine initiation among African-Americans and Latinos has increased as years have passed since licensure. Findings from this review point to the need for more studies examining HPV vaccine initiation and completion among African-Americans and Latinos using theoretical frameworks grounded in culture. Our findings indicated that African-American, Latino, and non-Latino white parents share common barriers. However there are distinct barriers among African-Americans and Latinos compared to non-Latino parents. These barriers influence acceptance of the vaccine among African-American and Latino parents, such as sexuality-related concerns, religion derived concerns, and mistrust of HCPs and pharmaceutical companies are factors related to culture and context rather than personally derived attitudes towards the vaccine.

Among African-Americans in particular, the barriers that religious affiliation poses should be explored more in depth. However, this finding indicates that it may prove fruitful to engage faith-based organizations to promote vaccination. Further research should explore the specific issues that cause mistrust in the medical establishment and interventions may attempt to clarify issues that cause mistrust in health communication campaigns. Similarly, it is necessary to understand the nuanced influence of social support networks as interventions to promote the vaccine may be delivered through social networks.

Our findings indicated that few studies have been published reporting on the development, implementation, and testing of interventions to promote HPV vaccination among African-Americans and Latinos. However, a systematic review conducted in 2014 by the Community Preventive Services Task Force, an independent, nonfederal unpaid panel of public health and prevention experts, sheds light on the effectiveness of community-based interventions to promote other immunizations among medically underserved families. Findings indicate that implementation of a combination of the following strategies set up to increase community demand and facilitate access increases vaccination rates an average of 14 percentage points: client reminder and recall systems, manual outreach and tracking, client or community-wide education, client incentives, client-held paper immunization records, and case management, increases in availability/access in health care settings or by home visits, and by reducing out of pocket cost (Community Preventive Services, 2015). In the interest of accelerating the uptake of the HPV vaccine we advocate for the introduction of these strategies along with research on the most effective strategies to reduce African-American and Latino specific barriers yielded in this review.

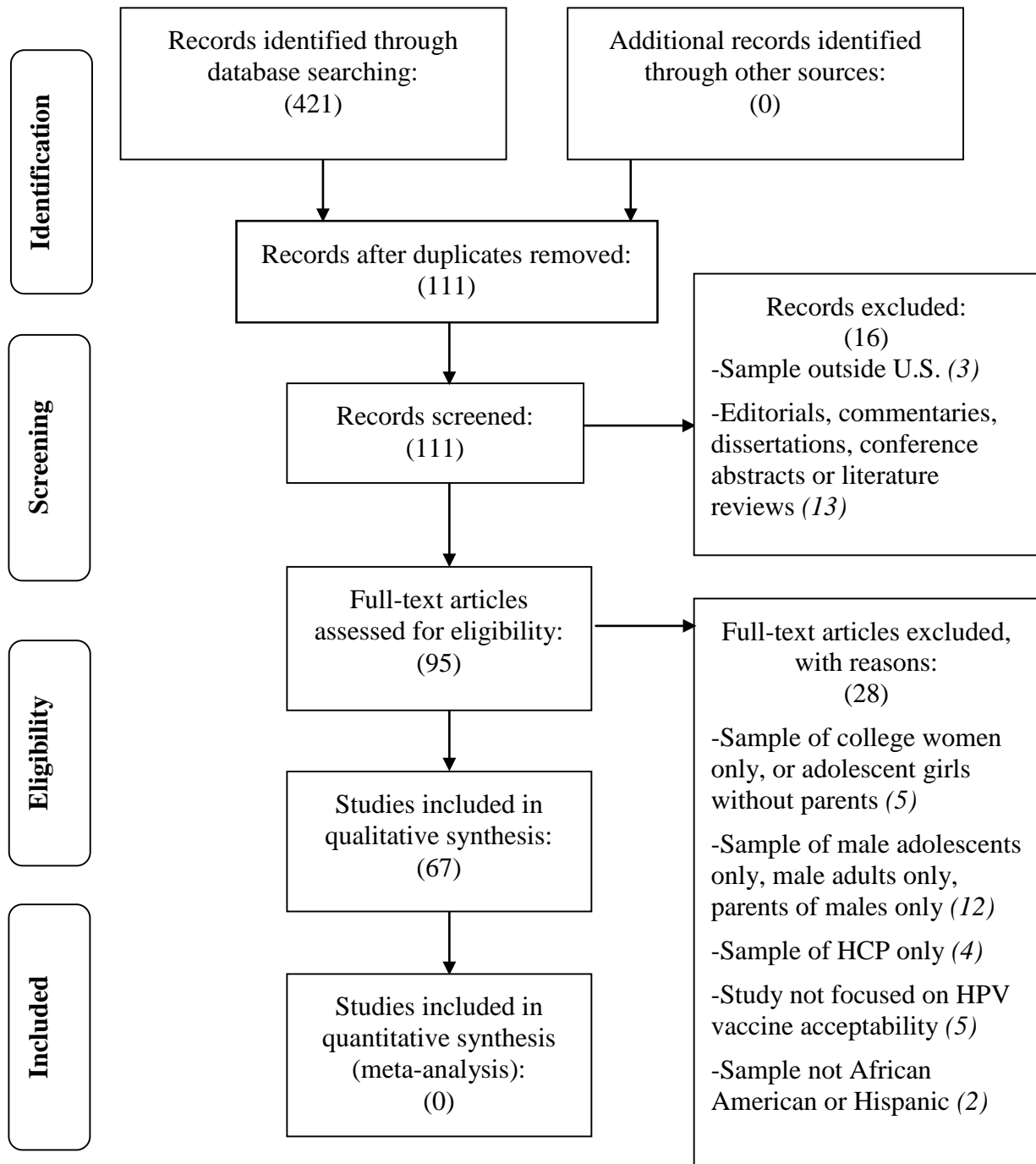


Figure 2.1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram. U.S.= United States; HCP= Health Care Provider; HPV= Human papillomavirus. Description of screening process and results.

Table 2.1. Characteristics of Studies Included in Review.

Study	Study design	Theoretical framework	Sample description
Allen, Othus et al. (2010)	Quantitative cross-sectional survey between September 2007- January 2009	Integrative model of behavioral prediction	<i>N</i> = 476 Parents of adolescent girls aged 9-17yo. NHW: 48%; Black: 30%; Hispanic: 22%
Allen, de Jesus et al. (2012)	Qualitative focus groups and interviews	NTS	<i>N</i> = 64 Parents of adolescent girls aged 9-17yo. Black: 59%; NHW: 23%; Hispanic: 19%
Bair, Mays et al. (2008)	Qualitative semi-structured interviews from November 2004 to March 2005	NTS	<i>N</i> = 40 Latina mothers
Baldwin, Bruce et al. (2013)	Quantitative cross-sectional survey between December 2008- May 2010	Heuristic systematic model & elaboration likelihood model	<i>N</i> = 256 Mothers of unvaccinated daughters aged 8-22yo. Black: 48.8%; Hispanic: 29.3%; NHW: 18%; Other: 3.9%
Barnack-Tavlaris, Garcini et al. (2014)	Quantitative analysis of 2007 California Health Interview Survey	NTS	<i>N</i> = 2,994 Mothers of daughters aged 8yo or older. U.S. born mothers: NHW: 84.7%; Hispanic: 12.4%; Asian: 2.9% Foreign-born mothers: NHW: 14.4%; Hispanic: 54%; Asian: 31.5%
Blackman, Thurman et al. (2013)	Quantitative cross-sectional survey between 2008 and 2010	NTS	<i>N</i> = 555 Black participants from the U.S. and Bahamas.
Brawner, Baker et al. (2012)	Qualitative and Quantitative	TPB	<i>N</i> = 48 Parents 100% African American
Casillas, Singhal et al. (2011)	Quantitative cross-sectional survey between	NTS	<i>N</i> = 294 Minority women Latina: 55%; Chinese: 22%; Korean:

Study	Study design	Theoretical framework	Sample description
	January 2009- November 2009		9%; African American: 9%
Cates, Brewer et al. (2009)	Quantitative cross-sectional survey between April and May 2006	NTS	<i>N</i> = 138 Women Black: <i>n</i> = 91; White: <i>n</i> = 47
Cates, Shafer et al. (2010)	Quantitative analysis of 2008 Child Health Assessment and Monitoring Program survey	NTS	<i>N</i> = 696 Parents of females aged 10-17yo. Racial demographic of daughters: NHW: 63.3%; African American: 22.9% (race not reported for parents)
Chao, Slezak et al. (2009)	Quantitative analysis of Kaiser Permanente Southern California health records	NTS	<i>N</i> = 148,350 Mother-daughter pairs NHW: <i>n</i> = 27,052 (18.2%); African American: <i>n</i> = 10,855 (7.3%); Hispanic: <i>n</i> = 38,125 (25.7%); Asian: <i>n</i> = 5,739 (3.8%); Other: <i>n</i> = 66,579 (44.9%)
Constantine and Jerman (2007)	Quantitative and Qualitative	NTS	<i>N</i> = 522 Parents Hispanic: <i>n</i> = 200 (38.2%); NHW: <i>n</i> = 211 (40.5%); African American: <i>n</i> = 36 (6.9%); Asian: <i>n</i> = 40 (7.7%); Other: <i>n</i> = 28 (5.4%)
Cox, Cox, et al. (2010)	3x2 Between subjects factorial design	NTS	<i>N</i> = 471 Mothers of girls aged 11-16yo. NHW: 58.4%; African American: 21.4%; Hispanic: 19.7%
Davlin, Berenson et al. (2015)	Quantitative questionnaire between September 2011 and September 2012	NTS	<i>N</i> = 638 Mothers of children aged 9-18yo.
Dorell, Yankey et al. (2011)	Quantitative analysis of 2008-2009 National Immunization Survey-Teen	NTS	<i>N</i> = 18,228 Adolescent girls aged 13-17yo. NHW: <i>n</i> = 12,810; Hispanic: <i>n</i> = 2,125; Black: <i>n</i> = 1,951

Study	Study design	Theoretical framework	Sample description
Dorell, Yankey et al. (2014)	Quantitative analysis of 2010 National Immunization Survey-Teen	NTS	<i>N</i> = 4,103 Adolescent girls aged 13-17yo. NHW: <i>n</i> = 2,794; Black: <i>n</i> = 473; Hispanic: <i>n</i> = 509; Other: <i>n</i> = 327
Fazekas, Brewer et al. (2008)	Quantitative survey between April 2006-May 2006	HBM	<i>N</i> = 146 Rural women African American: <i>n</i> = 91 (62%); White: <i>n</i> = 47 (32%); American Indian: <i>n</i> = 3 (2%); Not stated: <i>n</i> = 5 (3%)
Fishman, Taylor et al. (2014)	Quantitative longitudinal study	NTS	<i>N</i> = 149 Parents (mothers and fathers) African American: <i>n</i> = 40 (95.2%); Hispanic: <i>n</i> = 4 (2.7%) <i>N</i> = 211 daughters aged 13-18yo.
Gerend, Zapata et al. (2013)	Quantitative cross-sectional survey	NTS	<i>N</i> = 200 Latina mothers
Getrich, Broidy et al. (2014)	Quantitative and Qualitative between September 2009 and March 2009	NTS	<i>N</i> = 30 Interviews <i>n</i> = 8 clinicians; <i>n</i> = 10 mothers; <i>n</i> = 12 girls aged 12-17yo
Gilkey, Magnus et al. (2014)	Quantitative analysis of 2010 National Immunization Survey-Teen	HBM	<i>N</i> = 9,623 Parents Children demographics: NHW: 66%; Black: 16%; Hispanic: 11%
Guerry, De Rosa et al. (2011)	Quantitative cross-sectional survey between October 2007 and June 2008	NTS	<i>N</i> = 509 Parents Hispanic: 81%; African American: 16%
Hamlish, Clarke et al. (2012)	Qualitative	NTS	<i>N</i> = 19 African American mother-daughter dyads.
Hughes, Jones et al.	Qualitative semi-	NTS	<i>N</i> = 20 Triads (mother-daughter-

Study	Study design	Theoretical framework	Sample description
(2011)	structured individual interviews between March 2010 and June 2010		clinician) Mothers: Black: $n = 12$, White: $n = 8$
Hughes, Cates et al. (2009)	Quantitative cross-sectional survey between July 2007-October 2007	NTS	$N = 889$ Caregivers of adolescent girls aged 10-18yo. White: 70%; African American: 23%
Hull, Williams et al. (2014)	Qualitative focus groups and interviews	Dissemination of innovation theory; Community-based participatory marketing model	$n = 34$ African American adolescent females aged 11-18yo; $n = 31$ mothers
Joseph et al. (2012)	Quantitative cross-sectional survey between October 2008 and March 2009	HBM	$n = 19$ African Americans; $n = 51$ Haitians
Kepka, Coronado et al. (2011)	Quantitative experimental study between July – September 2009	NTS	$N = 88$ Hispanic parents of daughters aged 9-17yo. $n = 78$ mothers; $n = 10$ fathers
Kepka, Ding et al. (2015)	Quantitative cross-sectional between August 2013- October 2013	NTS	$N = 118$ Latino parents of adolescent boys and girls aged 11-17yo.
Kepka, Warner et al. (2014)	Quantitative cross-sectional survey between August 2013-October 2013	Social ecological framework	$N = 67$ Latino parents of children 11-17yo.
Kepka, Coronado et al. (2012)	Qualitative study between June 2008- January 2009	Grounded theory used for data analysis	$N = 36$ Latino parents of daughters aged 9-14yo. $n = 25$ mothers; $n = 11$ fathers
Kepka, Ulrich et al. (2012)	Quantitative cross-sectional survey between July 2009-September	Social ecological framework	$N = 78$ Rural Hispanic mothers of daughters aged 9-17yo.

Study	Study design	Theoretical framework	Sample description
	2009		
Kester, Zimet et al. (2013)	Quantitative cross-sectional survey conducted in 2010	NTS	<i>N</i> = 501 Mother-daughter pairs White: 59%; Hispanic: 22%; Black: 14%; Other: 5%
Lau, Lin et al. (2012)	Quantitative cross-sectional analysis of 2007 National Survey of Children's Health	NTS	<i>N</i> = 16,139 Adolescent females aged 12-17yo. HPV vaccine series non-initiators' race/ethnicity: White: 59%; Latino: 18%; African American: 17%; Asian/Pacific Islander: 3% HPV vaccine series initiators' race/ethnicity: White: 61%; Latino: 16%; African American: 15%; Asian/Pacific Islander: 3%
Laz, Rahman et al. (2012)	Quantitative analysis of the 2010 National Health Interview Survey	NTS	<i>N</i> = 2,171 National sample of adolescent girls aged 11-17yo. NHW: <i>n</i> = 940; Black: <i>n</i> = 384; Asian: <i>n</i> = 127; Hispanic: <i>n</i> = 645; Other: <i>n</i> = 75
Lechuga, Swain et al. (2011)	Quantitative experimental study	Prospect theory	<i>N</i> = 150 Mothers Hispanic: <i>n</i> = 50; NHW: <i>n</i> = 50; African American: <i>n</i> = 50
Lechuga, Vera-Cala et al. (2014)	Quantitative cross-sectional phone survey	HBM, TPB	<i>N</i> = 296 Latinas
Litton, Desmond et al. (2011)	Quantitative cross-sectional statewide telephone survey between December 2008- April 2009	NTS	<i>N</i> = 421 female caregivers of adolescent girls aged 10-14yo. NHW: 89.8%; African American: 9%
Luque, Raychowdhury et al. (2012)	Qualitative focus groups and interviews	Social marketing framework	<i>N</i> = 20 Hispanic immigrants and HCPs <i>n</i> = 5 mothers; <i>n</i> = 7 fathers; <i>n</i> = 8 HCPs
Morales-Campos,	Qualitative focus groups	Grounded theory used	<i>n</i> = 24 Hispanic mothers; <i>n</i> = 28

Study	Study design	Theoretical framework	Sample description
Markham et al. (2013)		for data analysis	Hispanic girls
McRee, Reiter et al. (2010)	Quantitative cross-sectional telephone survey between July- October 2007	NTS	<i>N</i> = 1,220 Parents of adolescent girls aged 10-18yo. NHW: 74%; Black: 20.3%; Hispanic: 5.7%
Middleman and Tung (2010)	Quantitative cross-sectional questionnaire in May 2009.	NTS	<i>N</i> = 615 Caregivers of girls aged 11-14yo. Hispanic: 81%; Black: 16%
Perkins, Pierre-Joseph et al. (2010)	Qualitative interview between June 2007 and February 2008	Grounded theory used for data analysis	<i>N</i> = 73 Parents NHW: <i>n</i> = 19 (26%); African American: <i>n</i> = 18 (25%); Afro-Caribbean or African: <i>n</i> = 15 (21%); Latino: <i>n</i> = 21 (29%)
Podolsky, Cremer et al. (2009)	Quantitative cross-sectional survey	NTS	<i>N</i> = 148 Latina mothers from New York City; <i>N</i> = 160 Parents from El Salvador
Polonijo, Carpio et al. (2013)	Quantitative analyses of 2008, 2009, and 2010 United States National Immunization Survey-Teen	Fundamental cause theory	<i>N</i> = 41,358 Mothers of adolescent girls aged 13-17yo. NHW: 60.7%; Hispanic: 17.6%, Black: 14.8%; Other: 6.9%
Ramirez, Jessop et al. (2014)	Qualitative ethnographic study	NTS	<i>N</i> = 17 Hispanic mothers and grandmothers
Rand, Schaffer et al. (2011)	Quantitative cross-sectional telephone survey between March 2007 and April 2008	HBM	<i>n</i> = 430 Parents of adolescents; <i>n</i> = 208 adolescents NHW: 51%; Black: 31%; Hispanic: 13%
Read, Joseph et al. (2010)	Quantitative cross-sectional survey between	NTS	<i>n</i> = 175 Adolescent girls aged 13-19yo; <i>n</i> = 74 Parents

Study	Study design	Theoretical framework	Sample description
	January 2007- June 2008		African American: 50.6%; African-Caribbean: 39.3%; Hispanic: 10.1%
Reimer, Houlihan et al. (2013)	Quantitative cross-sectional survey between June 2009- December 2009	TRA, TPB	<i>N</i> = 309 White and Latina women.
Reiter, Cates et al. (2010)	Quantitative analysis of 2008 Child Health Assessment and Monitoring survey	NTS	<i>N</i> = 617 Parents of adolescent females. Daughters: NHW: 67.6%; Black: 20.3%; Hispanic: 6.7%; Other race: 12%
Robitz, Gottlieb et al. (2011)	Quantitative cross-sectional survey between October 2007-June 2008	NTS	<i>N</i> = 484 Parents of adolescents girls Hispanic: 81%; African American: 15%
Sadigh, Dempsey et al. (2012)	Quantitative analysis of the 2006- 2008 National Survey of Family Growth	NTS	<i>N</i> = 4,283 Mothers of girls aged 9-18yo. African American: 15%; Hispanic: 17%
Sanderson, Coker et al. (2009)	Quantitative cross-sectional survey between April 2007- April 2008	NTS	<i>n</i> = 190 HPV positive Latina women; <i>n</i> = 215 HPV negative Latina women
Sanders Thompson, Arnold et al. (2012)	Qualitative cross-sectional questionnaire between February 2009- June 2009	NTS	<i>N</i> = 30 African Americans <i>n</i> = 25 women; <i>n</i> = 5 men
Savas, Fernandez et al. (2012)	Quantitative cross-sectional survey between September 2009- October 2009	NTS	<i>N</i> = 99 Parents of daughters aged 9-17yo. Hispanic: 47%; Black: 43%; NHW: 3.4%; Other: 7%
Shelton, Snaveley et al. (2013)	Quantitative cross-sectional survey between September 2007- January 2008	TPB	<i>N</i> = 476 Parents of daughters aged 9-17yo. White: 47%; Black: 30%; Hispanic: 23%
Stevens, Caughy et al. (2013)	Quantitative cross-sectional survey between	NTS	<i>N</i> = 288 Hispanic mothers of females aged 8-22yo.

Study	Study design	Theoretical framework	Sample description
	December 2008- May 2010		
Thomas, Strickland et al. (2012)	Quantitative cross-sectional survey	HBM	<i>N</i> = 400 African American parents of girls aged 9-13yo.
Thomas, Strickland et al. (2013)	Quantitative cross-sectional survey between September 2009- April 2011	HBM	<i>N</i> = 519 Parents African American: 77.3%
Thompson, Arnold et al. (2011)	Quantitative cross-sectional survey between February 2009- June 2009	NTS	<i>N</i> = 200 African American parents of females aged 9-17yo.
Tsui, Singhal et al. (2013)	Quantitative cross-sectional survey between January 2009- November 2009	NTS	<i>N</i> = 468 Parents of adolescent girls aged 9-18yo. Latina: 51.6%; Chinese: 19.3%; Korean: 14.2%; African American: 8.1%; Other: 6.8%
Venkatesh, Acosta et al. (2013)	Quantitative cross-sectional survey during the 2011– 2012 school year	NTS	<i>N</i> = 219 Parents of middle-school children. NHW: 82.8%; Hispanic: 17.2%; Black: 8.9%; Asian: 7.9%
Warner, Lai et al. (2014)	Quantitative and Qualitative study between August 2013- October 2013	Social ecological framework	<i>N</i> = 52 Latino parents of children aged 11-17yo.
Watts, Joseph et al. (2009)	Quantitative cross-sectional survey between August 2007-April 2008	NTS	<i>n</i> = 86 Latinas aged 18-55yo; <i>n</i> =141 non-Latinas aged 18-55yo
Wisk, Allchin et al. (2014)	Quantitative cross-sectional analysis of 2010 National Health Interview Survey	NTS	<i>N</i> = 5,735 Parents of pre-adolescents and adolescents aged 8-17yo. White: 61.2%; Black: 14.3%; Hispanic: 19.3%

Study	Study design	Theoretical framework	Sample description
Wu, Porch et al. (2010)	Quantitative cross-sectional survey between July 2007- April 2008	NTS	<i>N</i> = 206 Latina women
Yeganeh, Curtis et al. (2010)	Quantitative retrospective cohort study between May 2008- June 2008	NTS	<i>N</i> = 95 Parents of girls aged 11-17yo. Latino: 91%; Other: 9%

Note. NTS = No theory stated; TRA = Theory of Reasoned Action; TPB = Theory of Planned Behavior; HBM: Health Belief Model; U.S. = United States; HCPs= Health Care Providers; NHW= Non-Hispanic white.

Table 2.2. Major Findings Related to African-American and Latino Parental Acceptance and Uptake for the HPV Vaccine.

Themes	Major findings
Awareness and Knowledge of HPV and the HPV vaccine	<ul style="list-style-type: none"> • <i>African-Americans</i> with higher SES had higher HPV awareness. • <i>Latinos</i> who scored higher on U.S. acculturation had higher HPV awareness. Mixed findings regarding the direction of association between acculturation and HPV knowledge.
HPV Vaccination Barriers	<ul style="list-style-type: none"> • <i>Among African-Americans</i>, HPV vaccination barriers were insufficient information, lack of a HCP recommendation or hesitancy when recommending the vaccine, mistrust of HCP and pharmaceutical companies, perception that HPV vaccination is not needed, concern that daughter is too young for vaccination, religion, concern about vaccine effectiveness, cost, and lack of time. • <i>Among African-Americans and Latinos</i>, HPV vaccination barriers were sexuality-related concerns (concern HPV vaccination led to premarital sexual activity and that parents condoned premarital sex), concerns about vaccine safety, and low perceived risk of daughter acquiring HPV.
HPV Vaccine Acceptability and Intentions to Vaccinate	<ul style="list-style-type: none"> • Acceptance rates varied more <i>among African-Americans</i> than <i>among Latinos</i>. • <i>Among African-Americans</i>, acceptability was associated with vaccine awareness, perception that the vaccine has cancer prevention benefits, vaccine being free of cost, religion, and social support. • <i>Among African-Americans and Latinos</i>, acceptability was influenced by parental views on sexuality, perceived daughter's risk of acquiring HPV and cervical cancer, social norms, HCP recommendations, and perceived severity of being diagnosed with cervical cancer. • <i>Latina mothers</i> were twice more likely to accept HPV vaccination compared to mothers of other ethnicities.
HPV Vaccine Uptake	<ul style="list-style-type: none"> • <i>Among African-Americans and Latinos</i>, HPV knowledge was not related to vaccine uptake. Vaccine uptake was associated with receiving a HCP recommendation, being Latino, and perceived vaccine effectiveness and safety.

HPV Vaccine Series Completion

- *African-American and Latina* adolescent girls are less likely to complete the vaccine series than non-Hispanic white adolescent girls. Series completion was associated with being older (16 years old), not being Black or Latino, and having a household income between 133% to < 322% of the Federal Poverty line.

Note. SES= Socioeconomic status; U.S.= United States; HCP= Health Care Provider; HPV= Human papillomavirus.

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CHAPTER 3: AFRICAN AMERICAN PARENTS' AND DAUGHTERS' HPV VACCINATION ACCEPTANCE: AN INQUIRY GROUNDED IN CULTURE

Introduction

The Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States (US) (Centers for Disease Control and Prevention (CDC), 2014; Walboomers et al., 1999). Persistent infection with high-risk strains of HPV causes cervical cancer (CDC, 2014; Walboomers et al., 1999). African-American women have the highest cervical cancer mortality rate (4.0 per 100,000 persons) compared to Hispanic and non-Hispanic white women (2.7 deaths per 100,000 persons, and 2.1 deaths per 100,000 persons respectively) (CDC, 2015). African-American women also have the second highest cervical cancer incidence rate (9.2 new cases per 100,000 persons, respectively) compared to non-Hispanic white women (7.7 new cases per 100,000 persons) (National Cancer Institute, 2015).

The HPV vaccine is a preventive cervical cancer technology recommended for adolescent and young adult males and females. There are three HPV vaccines licensed for use in the US. The most recent is a 9-valent vaccine that protects against low-risk and high-risk strains (6,11,16, and 18), and protects against five other high-risk strains (31, 33, 45, 52, 58). High-risk strains are those associated with cervical cancer risk. The Advisory Committee on Immunization Practices recommends the HPV vaccines for routine administration for females and males ages 11 to 12 years old. Catch-up vaccination is recommended for females ages 13 to 26, males ages 13 to 21, and up to age 26 for men who have sex with men (CDC, 2015a). The HPV vaccines are administered in a three-dose series at 0 month, 1-2 months and 6 months. Research indicates that

the vaccines are safe and effective (Garland et al., 2015; Markowitz et al., 2013; Stokley et al., 2014).

According to the 2014 National Immunization Survey-Teen survey, coverage for initiation and completion of the HPV vaccine series for females increased from 56.7% and 36.8% in 2013 to 60% and 39.7% in 2014, respectively (CDC, 2015b). The HPV vaccination initiation rate among African-Americans (66.4%) is higher compared to non-Hispanic whites (56.1%). However, the HPV vaccination completion rate is lower among African-Americans (61.6%) compared to Latinas (72.8%), and non-Hispanic whites (70.6%), (CDC, 2015b). Ultimately, the HPV vaccination coverage rate is well below the Healthy People 2020 three-dose coverage goal of 80% for adolescent females (CDC, 2015b; HealthyPeople.gov, 2015).

Among African-Americans, HPV vaccination acceptance is below the rates of other childhood recommended vaccines. Although research on HPV vaccine acceptance among African-Americans is accumulating since the licensure of the vaccine, limited research has explored the role of factors other than those espoused by prominent health behavior change theories such as attitudes towards the vaccine and instrumental barriers (time, cost, health care access). The limited research that exists indicates that factors influenced by culture may play a prominent role in the decision of African-American parents to obtain the vaccine for their children. For example, factors derived from sources other than personal attributions towards the attitude object such as religion (Thomas, Strickland, Diclemente, & Higgins, 2013; Thomas, Strickland, DiClemente, Higgins, & Haber, 2012), social norms (Lechuga, Swain, & Weinhardt, 2011), mistrust of health care providers (HCP) and the healthcare system (Bynum et al., 2012), and concerns stemming from norms about sexuality have been identified as factors that play a role in HPV vaccination decisions among African-Americans.

Although previous studies have contributed to our understanding of the influence of culture on HPV vaccination decisions, several gaps remain. One important gap is the lack of studies informed by theories espousing the culture-related factors. The purpose of this study is to elucidate the role of culture on African-American parents and daughters' HPV vaccination acceptance by following the tenets of a culturally centered conceptual framework.

Conceptual Framework

The PEN-3 (Figure 1.1) (Airhihenbuwa, 1989) appears to be an appropriate model to guide the exploration of cultural factors that influence African-American parents and daughters HPV vaccine acceptance. The PEN-3 has been previously used to understand cervical cancer prevention behaviors among African-American college students and Latina immigrants (Bynum et al., 2012; Scarinci, Bandura, Hidalgo, & Cherrington, 2012). This framework identifies culture as the primary influence on individual engagement in preventive health behaviors. Shifting away from an exclusive focus on the individual, the PEN-3 incorporates the influence of the collective, the family and community, on the individuals' health experiences and health decisions (Airhihenbuwa, Ford, & Iwelunmor, 2014; Iwelunmor, Newsome, & Airhihenbuwa, 2014). The model also takes into account the multiple factors that determine health status, while also drawing on theories from cultural studies to develop comprehensive health education and health promotion programs. Fittingly, the PEN-3 cultural model is influenced by the HBM (Rosenstock, Strecher, & Becker, 1988), Theory of Reasoned Action (Fishbein & Ajzen, 1974), and the PRECEDE-PROCEED framework (Green & Kreuter, 1999). Two domains of the PEN-3 used to inform this study are: 1) the Relationships and Expectations domain and 2) the Cultural Empowerment domain. The Relationships and Expectations domain identifies perceptions (knowledge, attitudes, beliefs), enablers (community, environmental, structural factors) and nurturers (family, support networks) as important influences on health behaviors. The Cultural

Empowerment domain provides criteria for the classification of perceptions, enablers and nurturers as positive, exotic or negative. The influence of perceptions, enablers and nurturers are positive if they promote the behavior in question. Perceptions, enablers, and nurturers classified as exotic are beliefs and practices unfamiliar to western medicine, are not harmful, and do not necessarily change health behavior. Negative perceptions, enablers and nurturers prevent individuals from performing the health behavior.

In this study, perceptions are conceptualized as participants' awareness and knowledge of HPV and the HPV vaccine; and attitudes and beliefs towards vaccinations in general and HPV vaccination specifically. Enablers are conceptualized as exposure to messages in the media; receipt of a Health Care Provider (HCP) HPV vaccine recommendation; and, satisfaction with HCP communication about HPV vaccination. Nurturers are conceptualized as availability of a support network and social support; and, communication between parents and daughters about sex and health. Use of the PEN-3 cultural model provides a multi-level assessment of potential influencers that may affect African American parents' and daughters' cultural factors that influence their HPV vaccination acceptance, while also identifying potential areas for intervention development to address this health problem.

Methods

Grounded theory techniques and quantitative methods guided the exploration of cultural factors that influenced African-American parents' and daughters' HPV vaccine acceptance. Grounded theory techniques (Corbin & Strauss, 2008) included theoretical sampling and constant comparison analysis. Qualitative methods included Fisher's Exact Testing. The Institutional Review Board of the University of North Carolina at Chapel Hill approved this study.

Participants and Procedures

A total of 30 parents and 34 daughters participated in this study. Parents or guardians (referred to as parents) and daughters were recruited from two health departments serving low-income families in Guilford County, NC (Greensboro Department of Health and Highpoint Health Department), and from churches, hair salons, and public libraries in North Carolina and New York City. Recruitment strategies involved publishing advertisements within the health departments' newsletters, distributing flyers throughout hair salons, public libraries and the two health departments, meeting with church leaders to publicize the study, and through word of mouth. The study inclusion criteria was (1) Being African-American, (2) being a male or female parent, and (3) having a daughter between the ages of 12 -17 years. This age range was used because parental consent is required for HPV vaccination of individuals younger than 18 years of age.

The first author conducted open-ended semi-structured interviews of parents and daughters. Prior to beginning the interviews, informed consent and assent was collected, and participants completed a socio-demographic questionnaire that assessed age, daughters' HPV vaccination status, education, and other socio-economic factors. Participants were interviewed either in a private office at the Greensboro Department of Health or High Point Health Department, in coffee shops, in libraries or in their homes. Each interview was audiotaped, conducted separately and lasted 30 minutes to 2 hours. Both parents and daughters were interviewed until information redundancy and theoretical saturation was achieved (Corbin & Strauss, 2008; Sandelowski, 1995). At the end of the interviews, each participant received a \$20 gift card as compensation for their time.

The interview guide was developed based on the constructs of the PEN-3 and included questions asking about participants' perceptions, enablers, and nurturers that influenced HPV

vaccination acceptance. Examples of interview questions used to explore parents and daughters perception of vaccinations and HPV vaccine acceptance included: (1) “What is your perception of vaccinations in general: tell me some good and bad things about vaccinations,” (2) “Have you heard of HPV and the HPV vaccine and what do you know about each of them?” and (3) “What do you think of the HPV vaccine and what influences the way you think?” Similar questions were asked to explore other areas of interest. Participants were asked questions designed to promote an open discussion of individual, familial and community factors that influenced their beliefs about health, vaccinations and HPV vaccine acceptance. As the interviews progressed, the questions became more directed as the interviewer pursued analytic lines that emerged in previous interviews and probing questions were asked.

Data Analysis

All interviews were audiotaped, transcribed verbatim and checked for accuracy to ensure that transcription aligned with participants’ interviews. Participant information was de-identified and identification numbers were assigned for anonymity. The collected data were stored on password-protected computers and in private offices. Descriptive summaries were written for each transcript, which summarized participants’ experiences of cultural factors that influenced their HPV vaccine acceptance, and extracted exemplar quotes of their experience. The grounded theory techniques of theoretical sampling and constant comparative analysis (Corbin & Strauss, 2008) were used to sample specific cultural factors (perceptions, enablers, and nurturers) among parents and daughters that influenced HPV vaccine acceptance. These factors were compared to each other within and across parent and daughter groups, and were compared to existing concepts of culture according to the PEN-3. During this process, codes and categories of text that emerged from the data were organized according to the constructs in the two domains of the PEN-3.

Quantitative descriptive statistics consisted of *Fisher's Exact Test*, two-sided. *Fisher's Exact* testing was used to determine whether differences in cultural factors that influenced parents and daughters HPV vaccine acceptance were statistically significant. The goal of this analysis was to explore whether specific cultural factors emerged among parents and daughters. All quantitative analyses were performed with SPSS version 23.

Results

Table 3.1 presents demographic characteristics. As Table 3.1 shows, parents (93.3% female) had a mean age of 42.9 years old ($SD = 6.2$). Parents reported were married ($n = 17$, 56.7%), and Christian ($n = 29$, 96.7%), with a majority having some college or a college diploma ($n = 12$, 40.0%), or a terminal degree ($n = 9$, 30.0%). Most parents were employed ($n = 28$, 93.3%), worked in the service producing industry (i.e. nursing, teaching) ($n = 26$, 86.7%), and were insured ($n = 30$, 100.0%). Daughters had a mean age of 14.9 years old ($SD = 1.5$). The majority of daughters self-identified as Christian ($n = 32$, 94.1%), had insurance ($n = 34$, 100.0%), had some high school education or a high school diploma ($n = 27$, 79.4%). Nine daughters (26.5%) had completed the HPV vaccination series at the time of interviews.

The qualitative data are presented according to the PEN-3 domains: 1) Relationship and Expectation domain and subcategories perceptions, enabler, and nurturers; and, 2) Cultural Empowerment domain and subcategories positive, exotic and negative. The subcategories of the two domains were crossed to organize findings as a) perceptions, enablers and nurturers perceived as positive; b) perceptions, enablers and nurturers perceived as exotic; and, c) perceptions, enablers, and nurturers perceived as negative (Table 3.2). Table 3.2 summarizes key findings of this study, and Table 3.3 presents cultural factors that influenced parents and daughters HPV vaccine acceptance and statistical differences.

Positive Perceptions

Positive perceptions are those that encouraged participants to accept HPV vaccination. The perceptions that influenced parents and daughters to accept HPV vaccination included attitudes and beliefs towards vaccinations in general and HPV vaccination specifically, and awareness of HPV. Awareness of the HPV vaccine was defined as participants having heard of HPV and the HPV vaccine before the study.

Attitudes and beliefs towards vaccinations in general. A majority of parents ($n = 28$, 93.3%), and daughters ($n = 32$, 94.1%) felt positive towards vaccinations in general. Parents described their support of vaccinations in general being influenced by their experience with vaccinations and herbal remedies during childhood. Parents reported using home remedies due to a lack access to doctors. Once vaccinations became accessible, they were utilized and valued as an important aspect for disease prevention. One parent described her attitudes towards vaccinations:

I'm of the old school of you know, it didn't hurt me, it was just automatic growing up so it should be automatic with my kids. I mean for me measles, mumps, chicken pox. DTaP, that's understood . . .

Daughters were also in support of vaccinations in general. This general support of vaccinations was based on their trust and belief that vaccinations were beneficial and served to protect against diseases. Interestingly, daughters also acknowledged that some vaccinations had side effects. One daughter describes her beliefs towards vaccinations:

I am in favor of vaccines because I see more good about them than bad because there's only one major pet peeve and that's the whole possibility of getting sick, but other than that yeah.

Attitudes and beliefs towards HPV vaccination. Most parents ($n = 23$, 76.6%) and daughters ($n = 28$, 82.4%) had positive attitudes and beliefs about HPV vaccination (Table 3.4). Table 3.4 presents parents and daughters attitudes and beliefs towards the HPV vaccine. Parents'

positive attitudes and beliefs towards HPV vaccination stemmed from perceiving the vaccine to have cancer prevention benefits ($n = 17$, 56.7%), STD prevention benefits ($n = 14$, 46.7%), being safe ($n = 5$, 16.7%), and believing all girls should be vaccinated ($n = 1$, 3.3%). Daughters' positive attitudes and beliefs stemmed from perceiving the HPV vaccine has cancer prevention benefits ($n = 23$, 71.9%), STD prevention benefits ($n = 19$, 59.4%), should be given to all girls ($n = 13$, 40.6%) and is safe ($n = 8$, 25.0%). Interestingly, more daughters than parents held the belief that all girls should be HPV vaccinated, and this difference was statistically significant ($p = .001$). One daughter said:

I think every girl should get it just in case to be on the safe side. I would think every mother would want their child to get it even though they are not sexually active and if they are it's still good because they got the vaccine.

One parent said:

Like I said, it [HPV vaccination] helps prevent cancer or different sexually transmitted diseases. But cancer was my main thing because my husband's mother experienced breast cancer ...once I heard about it I wanted to get her [daughter] involved in it because of that...

Awareness of HPV. A majority of parents ($n = 28$, 93.3%) and daughters ($n = 27$, 79.4%) were aware of HPV and the HPV vaccine. Parents heard of HPV and the HPV vaccine from their daughters' HCP, daughters' school, television, the internet, or from a friend. Daughters heard about HPV and HPV vaccine from their HCP, school (health class or biology class), television, the internet, or from family and friends. One daughter explained how she learned about HPV from a school class project:

When I was in school we had to do a project because I was in parent and childhood development. She [her teacher] only made us do one [STD] but I wanted to look at all of them so I googled them when I got home. [I learned] that it [HPV] was bad. The genital warts in particular; it's like oh my God.

Exotic Perceptions

Exotic perceptions are beliefs that are unfamiliar to western medicine, are not harmful, and do not change the health behavior. In this section, we discuss parents and daughters who believed their religious beliefs had no influence on HPV vaccination acceptance.

Religious beliefs. Most parents ($n = 25$, 80.0%) and daughters ($n = 29$, 93.5%) reported that their religious beliefs did not influence their HPV vaccine acceptance. These parents reported that their HPV vaccination acceptance was based solely on the information they received about HPV and HPV vaccination and their perception that it was the right thing to do to protect their daughters. Daughters reported that their HPV vaccination acceptance was based on what they believed would protect them. This was due to parents and daughters' understanding that although their religious beliefs opposed premarital sex, religious beliefs alone were not enough to prevent daughters from initiating sexual relations. These parents and daughters separated their religious beliefs from HPV vaccination acceptance. One parent said:

The only way my religious beliefs affect me would be that I know the Bible says you should remain pure or you should not have sex until you are married and I should be with that one person. Do I know or understand that? Do I think that's realistic in this day and age? Hardly.... So no my religious belief would not hinder me or encourage me either to do this [HPV vaccination]. This is going to be a decision I would make based on what I see and what I hear and what I read.

One daughter said: "No, it's just what I think is right. What I should do to protect me."

Negative Perceptions

Negative perceptions are those that prevented participants from accepting HPV vaccination. The perceptions that prevented parents and daughters from accepting HPV vaccination included knowledge of HPV, attitudes and beliefs towards HPV vaccination, and religious beliefs.

Knowledge of HPV. Few parents ($n = 10$, 33.3%) and daughters ($n = 5$, 14.7%) perceived having adequate knowledge of HPV and the HPV vaccine. Parents and daughters' knowledge was lacking in several areas. For example, knowledge was lacking on HPV symptoms, transmission, origin, who is at risk, and side effects. Parents and daughters believed that their low HPV vaccine knowledge prevented their HPV vaccine acceptance. One parent said:

What I don't know though, can you actually die from it? How would you know if you have something if you can't identify with it? You got to have a way of knowing what to look for. So if you tell me that if you don't do this you might die, I need to know what the symptoms are. How it's going to affect my quality of life. That's important to me.

Attitudes and beliefs towards HPV vaccination. While a vast majority of parents and daughters possessed positive attitudes and beliefs towards the HPV vaccine, parents and daughters also possessed negative attitudes and beliefs that prevented HPV vaccine acceptance. More parents ($n = 22$, 73.3%) than daughters ($n = 17$, 50.0%) had negative attitudes and beliefs towards HPV vaccination, however this difference was not statistically significant (Table 4). Table 4 describes attitudes and beliefs among parents and daughters regarding HPV vaccine acceptance. Parents had negative attitudes and beliefs stemming from perceptions that the HPV vaccine is too new ($n = 15$, 50%), is not safe ($n = 16$, 53.5%), is not effective ($n = 12$, 40.0%), not a vaccine for kids ($n = 6$, 20.0%), daughters being too young ($n = 5$, 16.7%) and concerns that all vaccines are one size fits all ($n = 3$, 10.0%) (Table 3.4). One parent said:

I think some vaccinations are looked at as a one size fits all sort of thing but different populations of people are different so someone who's from Africa they may have a different genetic make-up and so their bodies would react to a vaccine differently than someone who's in North America. But I don't know if that's taken into consideration when vaccines are developed. I believe it's sort of a one size fits all sort of thing.

Religious beliefs. Parents ($n = 6$, 20%) and daughters ($n = 2$, 6.5%) also discussed how religious beliefs negatively influenced their HPV vaccine acceptance. For these parents and daughters, HPV vaccination was more than just a vaccination against cervical cancer; it was a vaccination against an STD. These parents and daughters believed that the decision to be HPV vaccinated should be based on the individuals' lifestyle choice. They believed that there was a right way and wrong way to treat their bodies according to religious doctrine and if the teachings about premarital sex were adhered to, then HPV vaccination was unnecessary. One parent said:

There are consequences, whatever seeds you sow, that's what you reap. That's sort of the rationale about vaccinations for STIs. It's a difference if you're talking about a vaccination for like pneumonia, the flu, the mumps certain things that are known that children have because of their interactions with others...that's not something that they can make a choice that will be a consequence of their choice, that's totally different. But when you talking about STIs most of the time that's a lifestyle choice. Not all the time but most of the time.

One daughter said:

It [The Bible] says flee from sexual immorality. Make Jesus first in everything. So if you're having sex outside of marriage that's not making Jesus first in your relationship with that person... the Bible says not to have sex outside the marriage then I don't have to worry about getting a sexually transmitted disease right now because I'm not married.

Positive Enablers

Enablers perceived as positive are those that influenced participants to accept HPV vaccination. The enablers that influenced parents and daughters to accept HPV vaccination included messages in the media, and receiving a HCP HPV vaccination recommendation. In this study, messages in the media were defined as receiving information on HPV and cervical cancer and included television, radio, the internet, or printed publications.

Messages in the media. Only parents ($n = 4$, 18.2%) reported that the media positively influenced their HPV vaccination acceptance, and this difference was statistically significant ($p = .03$, FET). The most frequently reported type of media influence included a) the Gardasil

commercial encouraging HPV vaccination ($n = 3$, 13.6%), b) seeing TV stars affected by HPV ($n = 1$, 4.5%), and c) trusting information read in medical journals ($n = 1$, 4.5%). One parent recalled her thoughts:

As far as on the commercials, the main thing that stuck out with me was cervical cancer and girls. And so just the word cancer to me period, just you know, it's kind of scary because I have had cancers in my family. So anything that will keep my kids living longer without cancer you know yeah I mean I'm for it.

HCP HPV vaccination recommendation. Twenty-five parents (83.3%) reported receiving a HCP recommendation regarding the HPV vaccine. Twenty parents (66.7%) reported valuing their daughters HCP recommendation regarding the HPV vaccine. Twenty-two parents (73.3%) received recommendations for their daughter to be HPV vaccinated, while three parents (10.0%) received recommendation against HPV vaccination. The recommendations against HPV vaccination were based on a pre-existing health condition, and the HCP believing daughters were too young for vaccination. A HCP recommendation promoted parents and daughters HPV vaccination acceptance. One parent described her reason for valuing HCPs recommendation:

...I basically just kind of talk to the doctor and just kind of see what's what. I feel like they have a little more knowledge. God gave everybody some type of gift... He gave the doctors the knowledge, the know how to do these things so you know. He's the healer but he's given them the knowledge of medicine because if it wasn't for him we wouldn't be able to have these things if he hadn't gave us the knowledge of these things.

Exotic Enablers

Enablers perceived as exotic are those that did not influence HPV vaccination acceptance. In this section, we discuss messages in the media that had no influence on HPV vaccination acceptance.

Messages in the media. Two parents (9.1%) and five daughters (16.7%) reported that although they saw the Gardasil commercial on television, the commercials had no influence on their HPV vaccine acceptance (not reported in table). One daughter said:

I always saw the Gardasil commercials but I guess I never really listened to them because they were always jumping rope or something. That's probably bad but yes I always heard the cancer part but I never really listened to if they said anything about HPV and if they said HPV I didn't really know what it was anyway.

Negative Enablers

Enablers perceived as negative are those that prevented participants from accepting HPV vaccination. The enablers that prevented parents and daughters from accepting HPV vaccination included messages in the media, and dissatisfaction with the quality of HCP communication about HPV.

Messages in the media. More parents ($n = 11$, 50.0%) than daughters ($n = 1$, 3.3%) reported that the media negatively influenced their HPV vaccine acceptance. This difference was statistically significant ($p < .001$). The most frequent negative media influence among parents included seeing messages on a) side effects of medications in general ($n = 6$, 27.3%), b) side effects of HPV vaccination ($n = 3$, 13.6%), c) African-Americans being historically abused by the medical profession ($n = 2$, 9.1%), and d) the politicization of HPV vaccination ($n = 1$, 4.5%). Among daughters, the only negative media influence reported was seeing messages on the side effects of medications in general ($n = 1$, 3.3%). For example, one parent said:

...the same week I heard on T.V. that some girl died from it [HPV vaccination] and that made me more uncomfortable. So then I called them back and said well I'm just going to hold off for now. And then she [the HCP] called me back and said the percentages- it's like point one. I said what if my daughter is the point one percent.

Dissatisfaction with HCP communication. Almost half of parents ($n = 12$, 40.0 %) reported dissatisfaction with the quality of communication they received from their daughters HCP regarding the HPV vaccine. Parents' dissatisfaction with their HCP HPV vaccine communication focused on not receiving enough information about the HPV vaccine regarding

the origins of the HPV vaccine, effectiveness, side effects, and not being informed in advance of their appointment that daughters would be getting a new vaccine. One parent reported:

Maybe they [doctors] could go into more, what's the effect and what will happen. The doctors don't explain like that. They just say X is at the age that she should have HPV vaccine. No, no, no, X is not at the age. ... that wasn't enough [information]...

Nurturers Perceived as Positive

Nurturers perceived as positive influenced participants to accept HPV vaccination. A supportive network and social support, and communication between parents and daughters were positive influences on HPV vaccination acceptance.

Support network and social support. A majority of parents and daughters in this study reported having a combination of family ($n = 25$, 83.3%; $n = 34$, 100%), friends ($n = 14$, 46.7%; $n = 17$, 50.0%), members of their church ($n = 9$, 30.0%; $n = 10$; 29.4%), God ($n = 15$, 50.0%; $n = 16$, 47.1%) and/or themselves ($n = 3$, 10.0%; $n = 0$) in their support network. During parents' HPV vaccination acceptance process, family ($n = 10$, 33.3%), friends ($n = 5$, 16.7%) and church members ($n = 1$, 3.3%) were consulted more frequently and used in some combination. During daughters HPV vaccination acceptance process, family ($n = 17$, 50.0%), and friends ($n = 1$, 2.9%) were consulted more frequently and also in some combination.

Social support received from network members was generally perceived as positive, encouraging HPV vaccination acceptance. Eight parents (26.7%) and 14 daughters (42.4%) received advice, information about HPV vaccination, validation of information received from HCP, and assistance to understand information on HPV vaccination (Table 3.6). Table 3.6 presents parents and daughters' evaluation of the type of social support received from their support network. One parent recalled turning to her family member for advice on HPV vaccination:

I spoke to my uncle ...I'm like what do you think about Gardasil? And he told me "it's a good thing. Any vaccination is a good thing. Don't worry about the hysteria," you know, he's been a doctor for forty years. He's like, "I've heard things from chicken pox giving kids cerebral palsy..." so I mean they've doctored [practiced] here as well as in Haiti. I trust them whenever there's an issue or problem with me or with my kids.

Parents ($n = 3$, 10.0%) were recipients of emotional support perceived as positive (Table 3.5). Emotional support received in the form of information that was shared among network members who had initiated or completed the HPV vaccination series. A parent reported hearing her sister had HPV vaccinated her daughter:

... my sister was telling me that her daughters get it [HPV vaccine]... it made me feel a little bit better because I know she's kind of a paranoid person too, so I say okay, if she's so paranoid and she give it to her daughter so I feel a little bit better.

Daughters were recipients of instrumental support. Thirteen daughters (39.4%) reported receiving instrumental support in the form of assistance getting to appointments for HPV vaccination (Table 3.5). Table 3.6 describes the type of social support parents and daughters received from their social support network. A daughter who had begun the HPV vaccination series said, "I didn't drive myself so I had to depend on my mom."

Communication between parents and daughters about sex and health. A majority of parents reported having discussions with their daughters about sex ($n = 27$, 90.0%) and health ($n = 29$, 96.7%). A majority of parents reported growing up in households where conversations about sex ($n = 24$, 82.8%) and health ($n = 20$, 69.0%) were not topics that were discussed. Parents reported that topics such as sex and health were considered taboo and inappropriate for kids. Although this experience made it difficult for some parents to transition into talking to their own daughters about sex, and health, a majority of parents reported using the HPV vaccination appointment as an opportunity to initiate conversations about HPV and other STDs, sex, and reproductive health. For example, one parent said:

I told them that there are certain things the human papillomavirus causes, and with cervical cancer, I showed them where the cervix is... And then X [her younger daughter] was like why are we talking about sex? I said because it's going to happen. ...she's like I don't want to have this conversation. I said okay when you're ready we can have it. And we did have that conversation eventually...

Nurturers Perceived as Negative

Nurturers were social network members that prevented participants from accepting HPV vaccination. In this section, we discuss how social support perceived as negative or lacking prevented parents and daughters from accepting HPV vaccination.

Support network and social support. Fourteen parents (46.7%) and 16 daughters (47.1%) reported not using their support network during the HPV vaccine acceptance process due to a perception that network members lacked knowledge of HPV or had negative perceptions about HPV vaccine. Nine parents (30.0%) and 10 daughters (30.3%) received informational support that was perceived as negative (Table 3.6). One parent described the negative advice she received from her network:

The friends that I do have in my circle is small, no one was an advocate for it. All of us were kind of against it even if we didn't know why. We just knew we were against it...it didn't sound right... They wanted their children to be older. Even here it says like at the age of 9 and 9 is just so early to be discussing things I think.

A daughter described how information received from her mother about side effects negatively influenced her HPV vaccination acceptance:

I probably wouldn't be in favor of the HPV vaccine and that's the only one I can think of. I know that it's a shot and I know that they like inject some of the disease into you so that like you can be immune to it.... Our mom was explaining to us last night the side effects. And I feel like if you're okay with those side effects, then you can get the vaccine but I'm not particularly okay with those side effects...

Discussion

The purpose of this study was to contribute to our understanding of the influence of culture on HPV vaccination decisions among African-American parents and daughters. We informed our study with the PEN-3 theoretical model, which posits that culture consists of individual level perceptions (attitudes, beliefs), enablers (community, environmental, structural factors) and nurturers (family, support networks), which in turn exert an influence on health. To our knowledge, this is the first study to explore the influence of culture using a theory driven and multi-level approach on African-American parents and daughters' HPV vaccination acceptance. The overall findings of this study support the importance of culture on African-American parents and daughters' HPV vaccination acceptance and those influences at the individual, familial, and community levels.

Cultural factors that empowered parents and daughters HPV vaccination acceptance should be viewed as strengths of this population. Culturally empowering perceptions toward HPV vaccination acceptance among these African-American parents and daughters included support for vaccines in general. Contrary to the many studies that document African-Americans being mistrustful of vaccines (Plough, Bristow, Fielding, Caldwell, & Khan, 2011; Shui, Kennedy, Wooten, Schwartz, & Gust, 2005) an overwhelming amount of parents and daughters in this study were in support of vaccinations in general. Parents were likely socialized to accept and value the importance of vaccines through interactions with their parents and other family members. Parents felt positive about having vaccines available for the prevention of illness, particularly since vaccines were not always accessible to them during their formative years. For example, the use of formal medical care was not readily available in rural areas of the Southern US, the Caribbean and West Africa. As a result, herbal remedies were used to treat illnesses. The use of herbal and alternative medical practices by African-Americans can be traced back to

Western African healing practices and was a major factor in maintaining health during slavery in the US and the Caribbean (Covey, 2008). Our findings indicate that African-Americans' use of alternative medical practices did not prevent their acceptance of western medical technologies such as vaccinations. Both medical practices were used to prevent disease. Parents further described that when access to vaccinations became possible, their parents welcomed these practices in order to guard their children from many infectious diseases rampant in their environment.

A majority of parents and daughters had both positive and negative perceptions about the HPV vaccine that promoted and prevented HPV vaccination acceptance. Among parents and daughters, positive attitudes and beliefs that promoted HPV vaccination focused on the HPV vaccine having cervical cancer and STD prevention benefits, being safe, and that all girls should be HPV vaccinated. Some parents and daughters held negative attitudes and beliefs towards HPV vaccination. Concerns centered on safety, side effects, newness of the vaccine, and concerns that initiation of the vaccine forces parents to engage in conversations about sex during pre-adolescent years. However, daughters were more likely to endorse the belief that all girls should be vaccinated against HPV and parents were more likely to hold negative attitudes and beliefs. These attitudes and beliefs about HPV vaccination are supported by literature guided by traditional health behavior change theories (Hamlsh, Clarke, & Alexander, 2012; Perkins, Pierre-Joseph, Marquez, Iloka, & Clark, 2010; Read, Joseph, Polishchuk, & Suss, 2010). However, by using a culturally centered framework, our study expands on prior findings by highlighting other potential reasons for negative attitudes such as concerns with the potential lack of diversity in clinical trial patients in whom the vaccine was tested. Parents reported that the clinical testing of vaccines should take into consideration the geographic location, racial and

genetic make-up of individuals to truly test adverse side effects. In this way, parents' concern that current vaccines are designed using a one size fits all approach may be alleviated as vaccines would be designed and clinically tested among populations they are intended to be used.

Similar to findings in other studies, religious beliefs generally did not influence parents and daughters HPV vaccination acceptance (Thompson, Arnold, & Notaro, 2012). Parents and daughters viewed HPV vaccination acceptance as separate from their religious beliefs. Parents' decision to vaccinate relied on the information they received about HPV and a moral obligation to protect their daughters. Similarly, daughters reported that their HPV vaccination acceptance was based on what they believed would protect them from diseases. For parents and daughters identified as Christian, the absence of premarital sex was seen as unlikely. The HPV vaccine was viewed as a vaccine that could prevent them from contracting an STD or cervical cancer. Our findings suggest that although adolescent girls may grow up in religious environments and learn biblical teachings regarding sexuality, they may compartmentalize their religious beliefs from other aspects of their lives, such as HPV vaccination acceptance.

For a minority of parents and daughters, religious beliefs prevented HPV vaccination acceptance. For these parents and daughters, HPV vaccination acceptance was a decision intertwined with their religious beliefs. Parents and daughters perceived HPV vaccination acceptance as a decision based on an individuals' lifestyle choice. In particular, the belief was articulated that vaccination was unnecessary for adolescents who are taught to live according to religious doctrine emphasizing the absence of premarital sex. Similarly, daughters reported believing that HPV vaccination was unnecessary because they believed in the religious doctrine of abstinence and intended to follow it. For these parents, separating their religious beliefs from their HPV vaccination decision was not possible due to the link between the HPV vaccine and a

STD. Among parents and daughters whose religious beliefs are closely intertwined with their HPV vaccine acceptance, it may be crucial for future research to explore strategies for compartmentalizing religious beliefs from health decisions to increase their likelihood of HPV vaccination acceptance. One potential strategy may be to highlight the immediate and long-term benefits of HPV vaccination and emphasize that although daughters may not engage in premarital sex, once married, they may still be exposed to HPV infection from partners who did not abide by religious doctrine. Emphasizing that HPV vaccination does not promote adolescent sexuality (Bednarczyk, Davis, Ault, Orenstein, & Omer, 2012) and is not reflectant of a devious lifestyle may help African-American parents and daughters accept HPV vaccination as a standard vaccine taken for cancer prevention.

Awareness and knowledge of HPV and HPV vaccine promoted and prevented parents and daughters HPV vaccination acceptance. Parents and daughters were aware and had some knowledge of HPV and the HPV vaccine, however, that knowledge was low. Awareness promoted HPV vaccination acceptance by enhancing their knowledge of a vaccine that prevented cervical cancer. Consistent with the HPV literature (McRee, Reiter, & Brewer, 2010), however, when parents and daughters lacked knowledge of HPV and the HPV vaccine, they were hesitant to engage in HPV vaccination acceptance since they had concerns about side effects, safety, and effectiveness. Information sources cited among parents and daughters for learning about HPV were HCPs, school, television, or family and other support network members. Schools may be a useful location for improving HPV vaccination awareness and knowledge among parents and adolescents. Parents and daughters reported receiving information from schools about HPV and the HPV vaccine and seemed to have positive attitudes towards it. As schools are very accessible

to parents and daughters, more research to examine how schools can be used to increase parents and daughters' awareness and knowledge of HPV may be favorable among this population.

Messages in the media had varied influences on parents and daughters HPV vaccination acceptance. For example, Gardasil commercials made parents aware of the HPV virus and the availability of the vaccine, which moved them toward HPV vaccination acceptance. Although daughters also viewed the Gardasil commercials, the information had no meaning to them. Additionally, daughters reported that the playful messages in which the information was communicated did not convey the seriousness of HPV and the necessity of HPV vaccination. Less frequently reported was the negative influence of messages in the media on HPV vaccine acceptance among daughters. Health research indicates that media exposure to conflicting health information leads to an increase in confusion, and decreases intentions to perform the health behavior (Nagler, 2014). The changes in HPV vaccination recommendations since FDA approval, coupled with the overemphasis on HPV vaccination side effects and the vaccine's politicization (Keelan, Pavri, Balakrishnan, & Wilson, 2010), have led parents to make their HPV vaccination decisions in a context characterized by controversy and conflicting information (Wailoo, Livingston, Epstein, & Aronowitz, 2010). Consistent messaging in HPV media campaigns along with trusted information sources may possibly reduce misinformation and concerns about HPV vaccination (Kessels et al., 2012).

Social support networks are an integral part of African-American culture (McAdoo & Younge, 2008). Our findings indicate that parents and daughters relied on their support networks when deciding whether to accept HPV vaccination (Javanbakht et al., 2012). Interestingly, parents and daughters received advice that was not always based on accurate information about HPV, but based on fears, mistrust and mixed messages from the media. Fears and fatalistic

attitudes towards cancer are often experienced and communicated within African-American support networks (Hamilton et al., 2015). As a result, African-Americans and support network members may become less likely to engage in health-promoting behaviors (Niederdeppe & Levy, 2007) and accept information about cancer (Miles, Voorwinden, Chapman, & Wardle, 2008). Findings from this study suggest that a multi-generational and multi-level intervention inclusive of parents, daughters, and their support network may be more beneficial to increasing African-American parents HPV vaccination acceptance.

Communication between parents and daughters about sex and health promoted HPV vaccination acceptance. Parents reported growing up in households where sex and health were inappropriate topics of discussion between parents and children. Parents perceived this childhood experience as a deterrent to engage in formal discussions about sex, health and HPV with their own daughters. Among other parents, a lack of communication about sex and health during childhood motivated them to engage daughters in formal discussions about sex, health, and HPV. Parents used HPV vaccination as an opportunity to provide daughters with information about sexual and reproductive health they wished they were taught during childhood. Literature supports the importance of adolescent support networks in providing formal and informal support concerning sex, such as information about sex and sexuality, advice on appropriate dating behaviors and choosing a partner, while promoting family values (George et al., 2013). Interventions that promote African-American parents and daughters discussion on HPV, and sexual health may be particularly valuable in this population.

A HCP recommendation promoted parents HPV vaccination acceptance. A HCP recommendation is one of the strongest predictors of HPV vaccination acceptance (Holman, Benard, Rolan et al., 2014), so it is encouraging that parents valued and trusted their HCPs HPV

vaccine recommendation. Similar to findings in a recent study (Gilkey, Malo, Shah, Hall, & Brewer, 2015), parents reported HCPs not recommending HPV vaccination due to daughters' young age. Since HPV vaccination is recommended for females as young as nine years old, lack of a strong HCP recommendation may further prevent HPV vaccination acceptance by promoting doubts and concerns. It may be beneficial for future studies to explore HCP providers' hesitation to vaccinate 9 year old adolescent girls with the HPV vaccine to better understand their concerns and reduce these missed opportunities for HPV vaccination acceptance.

Parents' dissatisfaction with the quality of HCP communication about HPV and the HPV vaccine prevented HPV vaccination acceptance. Parents' dissatisfaction focused on not receiving adequate information about HPV from HCPs and not having advanced notice that daughters would be receiving a new and unfamiliar vaccine. Parents suggested HCPs mailing home information about HPV and the HPV vaccine prior to appointments as another way to increase HPV vaccination acceptance. In this way, parents would be aware of HPV and the HPV vaccine and would have the opportunity to generate questions prior to scheduled appointments. Study findings also suggest some dissonance between the criteria HCPs use to determine adolescent girls' readiness for HPV vaccination compared to the criteria parents use for determining their daughters' readiness for HPV vaccination. While HCPs' criterion for determining adolescent girls' readiness for HPV vaccination is based on the age range within the ACIP guidelines, age range was not the determining factor among parents. Among parents, the factors for determining their daughters' readiness for HPV vaccination were a) if parents believed they had received enough information about the HPV vaccine and the HPV vaccination process, including information on daughters' health status post vaccination; and b) if parents believed the HPV vaccine was an appropriate vaccine for their daughters based on their perception of daughters'

sexual experience. This dissonance among HCPs and African-American parents on what determines adolescent girls' readiness for HPV vaccination suggest an unexplored area of research in understanding the perspective of African-American parents regarding HPV vaccination acceptance for their daughters. As HCPs become better able to understand the factors that are a priority to African-American parents' HPV vaccination acceptance for their daughters, appropriate communication strategies may be developed to strengthen the quality of HCPs and African-American parents HPV vaccine communication.

Limitations

A limitation to this study is that the coding of data was conducted by one rater. Having more than one rater would have provided opportunities to evaluate intercoder reliability on separate occasions to confirm categories and themes that emerged from the data (Campbell, Quincy, Osserman, & Pedersen, 2013). However, our analysis was strengthened by being grounded theoretically. The constructs of the PEN-3 model guided analysis and provided a preliminary coding scheme for emergent themes within the data. Another limitation was that participants were primarily African-American mothers and daughters. While, African-American fathers made up approximately 7% of parents, this study's findings may not be generalizable to them or to sons, as well as to fathers and sons from other racial/ethnic groups. Nevertheless, the participants in this study reflected an ethnically, and socio-economically diverse group of African-American parents and daughters with cultural roots from the Southern United States, Africa, and the Caribbean. Additionally, participants varied on education and income levels and daughters were in varying stages of the HPV vaccination process, which provided valuable information about cultural factors influencing HPV vaccination across the vaccination continuum.

Implications

The influence of culture on health and health related behaviors has received increasing attention in recent years, culminating in the recent National Institutes of Health's report "The Cultural Framework for Health." This report provides the first standardized definition culture and strategies to assess and operationalize culture in health behavior research to address disparate health outcomes among ethnic minority populations (Kagawa-Singer, Dressler, George, & Elwood, 2015). The findings in this study further support the need for culture to be explored in health behavior research among African-Americans. Our study shows that aspects of African-American culture are important to parents and daughters HPV vaccination acceptance and should be considered when developing culturally appropriate HPV vaccination interventions.

According to the PEN-3, the next step in developing an HPV vaccination acceptance intervention is for the researcher to return to the community to corroborate the study findings. Then collectively, the researcher and members of the community determine the next steps for developing a culturally-appropriate intervention targetted towards the needs of African-American parents and their daughters. In this light, future research should examine the effects of a multi-level and multi-generational educational and communications interventions inclusive of parents, daughters, and support network members on decreasing misinformation and negative attitudes and beliefs about HPV vaccination. Future research should also examine appropriate strategies for introducing new cancer health technologies (i.e. HPV vaccine) to African-Americans; strategies for improving the quality of HCPs and African-American parents' and daughters' communication skills about sex, health, and HPV vaccination; and, strategies for promoting African-American parents' and daughters' communication about sensitive topics such as sex, health, and HPV.

The HPV vaccine initiation and completion rates among adolescent males are significantly below that of adolescent females (CDC, 2015). Although African-American males were not the focus of this study, they are another group that should not be overlooked in HPV vaccine acceptance research. As emerging studies begin to focus on African-American adolescent males HPV vaccination acceptance (Shao, Nurse, Joseph, & Suss, 2015; Sledge, 2015), future research should also examine how culture influences HPV vaccination among African-American fathers and sons. Specifically, future research can examine communication patterns among fathers and sons about sexuality and health. This research would provide a deeper understanding of how culture functions similarly and in contrast to mothers and daughters and further elucidate the role of culture on this particular health behavior. A better understanding of how culture functions among fathers and adolescent males may greatly contribute to the development of future HPV vaccination interventions to increase acceptance among adolescent males.

Conclusion

Research on the influence of culture on African-Americans parents and daughters' acceptance of the HPV vaccine is both timely and necessary to reduce the cervical cancer burden in this population. This study supports the usefulness of the PEN-3 model in exploring the role of culture among African-Americans HPV vaccination acceptance and identifies relevant cultural factors among parents and daughters. Understanding the diverse factors that contribute to African-American parents and daughters HPV vaccination acceptance may inform the development of culturally appropriate interventions that advances the field of cervical cancer prevention research.

Table 3.1. Demographic Characteristics of Study Sample (N = 64).

Variable	Parent, n = 30	Girls, n = 34
Age in years, M (SD)	42.9 (6.2)	14.9 (1.5)
Gender, n (%)		
Female	28 (93.3)	-
Male	2 (6.7)	-
Marital status, n (%)		
Divorced	2 (6.7)	-
Married	17 (56.7)	-
Not married/ Living with partner	3 (10.0)	-
Single	8 (26.7)	-
Place of Birth, n (%)		
U.S.	16 (53.3)	34 (100.0)
Outside U.S. (Caribbean, West Africa)	14 (46.7)	-
Urban or Rural n (%)		
Urban	8 (26.7)	-
Rural	24 (73.3)	-
Income, n (%)		
<\$10k	3 (10.0)	-
\$10k-\$30k	6 (20.0)	-
\$30k-\$50k	10 (33.4)	-
>\$50k	11 (36.6)	-
Educational status, n (%)		
< High school/ Middle school	-	6 (17.6)
Some HS/ HS diploma	7 (23.3)	27 (79.4)
Some college or college diploma	12 (40.0)	1 (2.9)
Graduate diploma / Terminal degree	9 (30.0)	-
Other	2 (6.7)	-
Employment status, n (%)		
Employed	28 (93.3)	-
Unemployed	2 (6.7)	-
Type of work, n (%)		
Unemployed	2 (6.7)	-
Goods-producing industry	1 (3.3)	-
Service-producing industry	26 (86.7)	-
Student	1 (3.3)	-
Health insurance status, n (%)		
Insured	30 (100.0)	34 (100)
Uninsured	-	-
Religious or Spiritual, n (%)		
Yes	29 (96.7)	30 (88.2)
No	1 (3.3)	4 (11.8)
Religious association, n (%)		

Variable	Parent, <i>n</i> = 30	Girls, <i>n</i> = 34
Christian	29 (96.7)	32 (94.1)
No religious association	1 (3.3)	2 (5.9)
Religious Denomination, <i>n</i> (%)		
Baptist	5 (16.7)	5 (14.7)
Catholic	3 (10.0)	5 (14.7)
Non-Denominational	12 (40.0)	10 (29.4)
Pentecostal	3 (10.0)	3 (8.8)
Methodist	1 (3.3)	4 (11.8)
Others (Episcopal, COGIC)	6 (20.0)	3 (8.8)
None	-	4 (11.8)
Total HPV dosage received		
0-Dose	-	22 (64.7)
1-Dose	-	1 (2.9)
2-Doses	-	2 (5.9)
3-Doses	-	9 (26.5)

Table 3.2. *Perceptions, Enablers and Nurturers that Influence African-American Parents and Daughters HPV Vaccine Acceptance.*

PEN-3	Perceptions	Enablers	Nurturers
Positive	<i>Among parents and daughters, awareness of HPV and HPV vaccine, attitudes and beliefs towards vaccinations in general, and attitudes and beliefs towards HPV vaccine encouraged HPV vaccine acceptance.</i>	<i>Among parents, messages in the media, and HCP recommendation encouraged HPV vaccine acceptance.</i>	<i>Among parents and daughters, having support network, and social support received from network encouraged HPV vaccine acceptance. Among parents, communication between parents and daughters about sex and health encouraged HPV vaccine acceptance.</i>
Exotic	<i>Among a majority of parents and daughters, religious beliefs did not influence HPV vaccine acceptance.</i>	<i>Among few parents and daughters, messages in the media did not influence HPV vaccine acceptance.</i>	
Negative	<i>Among parents and daughters, inadequate knowledge of HPV and HPV vaccine, attitudes and beliefs towards HPV vaccine, and religious beliefs prevented HPV vaccine acceptance.</i>	<i>Among parents and daughters, messages in the media prevented HPV vaccine acceptance. Among parents, dissatisfaction with HCP communication prevented HPV vaccine acceptance.</i>	<i>Among parents and daughters, social support network, and social support received from network prevented HPV vaccine acceptance.</i>

Note. Perceptions, enablers and nurturers may have multiple types of influences on HPV vaccine acceptance. HCP= Health Care Provider; HPV= Human papillomavirus; PEN-3= PEN-3 cultural model.

Table 3.3. Cultural Factors that Influence HPV Vaccine Acceptance among Parents and Daughters.

	Parents <i>n</i> = 30		Daughters <i>n</i> = 34	
	<i>n</i>	%	<i>n</i>	%
Attitudes and beliefs towards vaccines in general	28	93.3	32	94.1
Attitudes and beliefs towards HPV vaccine (Positive)	23	76.7	28	82.4
Attitudes and beliefs towards HPV vaccine (Negative)	22	73.3	17	50.0
Awareness of HPV and HPV vaccine	28	93.3	27	79.4
Adequate knowledge of HPV and HPV vaccine	10	33.3	5	14.7
Religious beliefs	6	20.0	2	6.5
Messages in the media ^a	14	63.6	1	3.3**
Received HCP HPV vaccine recommendation	25	83.3	-	-
Dissatisfaction with HCP HPV vaccine communication	12	40.0	-	-
Communication between parents and daughters about sex	27	90.0	-	-
Communication between parents and daughters about health	29	96.7	-	-
Social support	19	63.3	22	66.7

Note. HCP= Health Care Provider; HPV= Human papillomavirus.

^a *n* = 22 parents responded; *n* = 30 daughters responded;

** *p* ≤ .01, two-tailed.

Table 3.4. Parents and Daughters Attitudes and Beliefs Towards HPV Vaccine.

	Parents <i>n</i> = 30		Daughters <i>n</i> = 32	
	<i>n</i>	%	<i>n</i>	%
Positive attitudes^a	23	76.7	28	82.4
Cervical cancer prevention benefits	17	56.7	23	71.9
STD prevention benefits	14	46.7	19	59.4
HPV vaccine is safe	5	16.7	8	25.0
All girls should be HPV vaccinated	1	3.3	13	40.6**
Negative attitudes^a	22	73.3	17	50.0
Age range is too young	5	16.7	-	-
HPV vaccine too new	15	50.0	2	6.3**
Concerns about safety	16	53.3	6	18.8**
Doubts about effectiveness	12	40.0	1	3.1*
Concerns about side effects	19	63.3	15	46.9
STD vaccine not for kids	6	20.0	-	-
All vaccines one size fits all	3	10.0	-	-
HPV vaccine mandate	1	3.3	-	-
Concerned >3 doses needed	2	6.7	-	-
Unsure if HPV vaccine is as important as other vaccines	-	-	1	3.1

Note. Participants could have had more than one type of attitudes and beliefs. STD= Sexually transmitted diseases; HPV= Human papillomavirus.

^a*n* =34 daughters responded.

p* ≤ .05, two-tailed. *p* ≤ .01, two-tailed.

Table 3.5. Type of Social Support Parents and Daughters Received from Support Network.

Type of Support Received	Parents <i>n</i> = 30		Daughters <i>n</i> = 33	
	<i>n</i>	%	<i>n</i>	%
Informational	16	53.3	17	51.5
Advice	15	50.0	14	42.4
Information about HPV vaccine	6	20.0	15	45.5*
Validating information received from HCP	2	6.7	5	15.2
Assistance to understand information	2	6.7	13	39.4**
Emotional	3	10.0	1	3.0
Hearing members in support network already vaccinated	3	10.0	1	3.0
Instrumental	-	-	13	39.4
Assistance getting to appointment	-	-	13	39.4

Note. Participants could have received more than one type of support. HPV= Human papillomavirus; HCP= Health Care Provider.

* $p \leq .05$, two-tailed. ** $p < .01$, two-tailed.

Table 3.6. Evaluation of Social Support Parents and Daughters Received from Support Network.

Evaluation of social support received	Parents <i>n</i> = 30		Daughters <i>n</i> = 33	
	<i>n</i>	%	<i>n</i>	%
Negative Informational Support	9	30.0	10	30.3
Positive Informational Support	8	26.7	14	42.4
Negative Emotional Support	-	-	1	3.10
Positive Emotional Support	3	10	-	-
Negative Instrumental Support	-	-	-	-
Positive Instrumental Support	-	-	13	39.4**

Note. Participants could have received more than one type of support.

***p* < .01, two-tailed.

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CHAPTER 4: THE INFLUENCE OF CULTURE ON AFRICAN-AMERICAN PARENTS AND DAUGHTERS' HEALTH BELIEFS TOWARDS HPV VACCINE ACCEPTANCE

Introduction

In the United States (US), about 12,900 new cervical cancer cases occur annually and 4,100 of these cases result in death each year (American Cancer Society, 2015). African-American women have a cervical cancer mortality rate that is almost twice the rate of non-Hispanic white women (4.0 deaths per 100,000 persons vs. 2.1 deaths per 100,000 persons), and higher than the rates for Hispanic women (2.7 deaths per 100,000 persons) (NCI, 2015). African-American women also have the second highest cervical cancer incidence rate (9.2 new cases per 100,000 persons, respectively) compared to non-Hispanic white women (7.7 new cases per 100,000 persons). Persistent infection with high-risk strains of the human papillomavirus virus (HPV) causes cervical cancer (Walboomers et al., 1999), and early age of sexual debut, high numbers of sexual partners, and multiple sex partners increases the risk of HPV infection (Hariri, Dunne, Saraiya, Unger, & Markowitz, 2011).

Between 2007 and 2015, the Advisory Committee on Immunization Practices (ACIP) approved three vaccines that protect against high-risk strains of HPV for use in adolescents. The more recent vaccine, HPV-9, protects against the same strain as the previous HPV-4 vaccine (6,11,16, and 18), and protects against additional high-risk strains 31, 33, 45, 52, and 58. The ACIP recommends the HPV vaccines for routine administration to females and males ages 11 to 12 years old. Catch-up vaccination is recommended to females ages 13 to 26, males ages 13 to 21, and up to age 26 for men who have sex with men (Centers for Disease Control and Prevention (CDC), 2015a). The HPV vaccines are administered in a three-dose series at 0 month,

1-2 months and 6 months and research indicates that the vaccines are safe and effective (Markowitz et al., 2013; Stokley et al., 2014).

The most recent statistics for national HPV vaccination coverage showed significant increases in coverage between 2013 and 2014 among females' ages 13 to 17 years (CDC, 2015b). Coverage for ≥ 1 dose and ≥ 3 doses of the HPV vaccine for females increased from 56.7% and 36.8% in 2013 to 60.0% and 39.7% in 2014 (CDC, 2015b). African-Americans now have higher initiation rates (66.4%, respectively) than non-Hispanic whites (56.1%), however, completion rates are lower among African-Americans (61.6%) than Hispanics (72.8%), and non-Hispanic whites (70.6%), (CDC, 2015b). Although HPV vaccination coverage is improving, rates are still below the rates of other childhood recommended vaccines (CDC, 2015b), leaving a great deal of adolescent females at risk for exposure to HPV.

Understanding a population's health beliefs is an important element in understanding how those beliefs influence their health and health outcomes. As such, the constructs of the Health Belief Model (HBM) (Rosenstock, 1990; Rosenstock, Strecher, & Becker, 1988) have been particularly useful in identifying health beliefs among African-Americans regarding HPV vaccine acceptance. Findings identified that African-American parents' perceived vulnerability to HPV, perceived severity of illness, perceived benefits of HPV vaccination and health care provider (HCP) recommendation were important predictors of HPV vaccination uptake (Brewer & Fazekas, 2007; Lechuga, Swain, & Weinhardt, 2011; Thomas, Strickland, DiClemente, Higgins, & Haber, 2012). Other studies also identified cultural influences on African-Americans beliefs towards HVP vaccine such as concerns about medical experimentation through vaccination, religious beliefs and family values, and religious denomination, were barriers to their HPV vaccination acceptance (Joseph et al., 2012).

Using the HBM to explore African-Americans' HPV vaccine acceptance have proved valuable in revealing new areas for research. To an extent, studies have explored the health beliefs of African-Americans however few studies have examined those beliefs among parent-daughter dyads, and from a cultural context. Exploring how the HBM constructs influence African-American parents' and daughters' HPV vaccination acceptance is an important strategy for understanding their use of preventive health behaviors, such as HPV vaccination. Hence, this study will explore how African-American parents and daughters' beliefs influences their HPV vaccination acceptance according to the constructs of the HBM, and determine if differences in beliefs between parents and daughters are statistically significant in chi square testing. While the HBM is frequently used to explore the health beliefs of mothers (Krawczyk, Perez, King, Vivion, Dube, & Roseberger, 2015; Joseph et al., 2012), to my knowledge, this is the first study to use the HBM to explore generational differences in how culture influences the health beliefs of parent-daughter dyads towards HPV vaccination acceptance.

Conceptual Framework

The HBM (Rosenstock, 1990; Rosenstock et al., 1988) is a psychological model that attempt to explain and predict health behaviors by focusing on attitudes and beliefs of the individual (*Figure 1.1*). The model has been used extensively to explore peoples' perceptions of disease and vaccination. The constructs of the HBM that guided this study were perceived susceptibility, perceived severity, perceived benefit, perceived barrier, cues to action (Hochbaum, 1958), and self-efficacy (Strecher, DeVellis, Becker, & Rosenstock, 1986). According to the HBM, individuals will adopt a new behavior to prevent a disease if a) they perceive themselves *susceptible* to the disease; b) they perceive the disease to have *severe* health consequences; c) they perceive engagement in the new behavior to be *beneficial* in reducing their susceptibility and severity of the disease; d) they believe the benefits of performing the new behavior outweighs

the *barriers* to performing the new behavior; e) they have sufficient *cues* or motivation; and, f) they believe themselves able to perform the new behavior (*self-efficacy*).

In this study, perceived susceptibility is conceptualized as perceiving adolescent girls to be at risk for getting HPV infection. Perceived severity is conceptualized as perceiving HPV infection, genital warts and cervical cancer as severe. Perceived benefit is conceptualized as perceiving HPV vaccination to be effective in preventing HPV infection and cervical cancer. Perceived barrier is conceptualized as perceiving factors (psychological or structural) as preventing HPV vaccination. Cues to action are events, people or things that motivate parents and daughters to accept HPV vaccination. Finally, self-efficacy is conceptualized as believing in the ability to be HPV vaccinated if decided. These constructs guided the exploration of African-American parents and daughters' attitudes and beliefs towards HPV vaccine acceptance.

Methods

A combined qualitative and quantitative methodology was used to explore how culture influences the health beliefs of 29 African-American parent-daughter dyads' HPV vaccine acceptance. In summary, a qualitative design using open-ended semi-structured interviewing, theoretical sampling and constant comparative analysis (Corbin & Strauss, 2008) were used to elicit participants' responses regarding the role of culture on their HPV vaccine acceptance. A quantitative descriptive analysis was used to describe the demographic characteristic of parents and daughters. Fisher's Exact Tests (cells smaller than five) was used to determine whether differences existed between parents and daughters on the health beliefs that influenced their HPV vaccine acceptance. Approval for this study was obtained from the Institutional Review Board at the University of North Carolina at Chapel Hill.

Participants

The study's inclusion criteria included participants who were (1) African-American, (2) male and/or female parent, and (3) had a daughter ages 12 -17 years old. Parents also had to be 18 years old or older given that parental consent is required for HPV vaccination, and more than one more than one parent or daughter who fit the inclusion criteria was eligible to participate. Within one parent-daughter dyad, both parents participated resulting in a total of 30 parents and 34 daughters recruited into this study. Principles of Community Based Participatory Research were used to design a recruitment strategy that emphasized community engagement. Community stakeholders such as nurses from the Greensboro Department of Health and Highpoint Health Department, pastors, and directors of community organizations facilitated in identifying and recruiting eligible parents and daughters from low-income areas of North Carolina and New York City. Participants were recruited from the Greensboro Department of Health and Highpoint Health Department, churches, hair salons, and public libraries in North Carolina and New York City. Recruitment strategies included publishing advertisements within the health departments' newsletters, distributing flyers, and through word of mouth.

Procedure

Once informed consent was collected, open-ended semi-structured interviewing was used to explore the health beliefs of parents and daughters towards HPV vaccination acceptance. Demographic questionnaires assessed participants' age, education, and other socio-economic factors. All parents and daughters were interviewed separately either in offices, coffee shops, libraries or in their homes. Interview times ranged from 30 minutes to 2 hours. Both parents and daughters were interviewed until information redundancy and theoretical saturation was achieved (Sandelowski, 1995). Once all interviews were completed, parents and daughters received a \$20 gift card as compensation for their time.

The interview guide was developed, in part, using some constructs of the HBM. Examples of interview questions used to explore parents and daughters perception of HPV vaccine acceptance included: (1) “Have you heard of HPV and the HPV vaccine and what do you know about them?” (2) “How susceptible do you think your daughter is to getting HPV” and (3) “How serious do you think getting HPV would be?” Similar questions were asked to explore other HBM constructs. Participants were asked questions designed to promote an open discussion of individual, familial and environmental factors that influenced their attitudes and beliefs about HPV vaccine acceptance. As the interviews progressed, the questions became more directed as the interviewer pursued analytic lines that emerged in previous interviews and probing questions were asked.

Data analysis

Qualitative and quantitative methods were used for data analyses. The goal of the qualitative analysis was to explore cultural factors that influenced parents’ and daughters’ HPV vaccine acceptance. Qualitative analysis consisted of theoretical sampling and constant comparative analysis (Corbin & Strauss, 2008) to sample specific cultural factors that influenced parents’ and daughters’ health beliefs towards HPV vaccine acceptance. These factors were compared to each other within and across parent and daughter groups, and were compared to existing concepts according to the HBM. During this process, codes and categories of text that emerged from the data were organized according to the constructs of the HBM. The goal of the quantitative analysis was to explore whether a pattern of specific cultural factors emerged among parents and daughters. The *Fisher’s Exact Tests* (dichotomous and categorical variables) were used to examine if there were significant differences in cultural factors that influenced parents’ and daughters’ health beliefs towards HPV vaccine acceptance. Quantitative analysis consisted of converting the codes from qualitative analysis to an SPSS database as a nominal variable, with

“1” indicating the presence and “0” indicating the absence of a code in each transcript. The Fisher’s Exact Test was used to compare the parent group to the daughter group on the frequency (occurrence) of each code, in order to identify group differences. An alpha level of .05 was used for all statistical tests. All quantitative analyses were performed with SPSS version 23.

Results

Thirty parents ($n = 30$) and thirty-four daughters ($n = 34$) were interviewed in this study. Most parents were mothers, while two were fathers ($n = 28, 93.3\%$) (Table 3.1). The average age of parents was 42.9 years old (range = 30-55; $SD = 6.2$) and several parents had some college education or a college degree ($n = 12, 40\%$). At the time of interviews, all parents had health insurance. A majority of parents worked in the service-producing industry such as nursing, teaching, and child-care ($n = 86.7\%$), and two were unemployed. Most parents considered themselves religious or spiritual ($n=29, 96.7\%$), Christian ($n = 29, 96.7\%$) and identified as non-denominational ($n = 12, 40.0\%$).

The average age of daughters was 14.9 years (range = 12-17; $SD = 6.2$). Most daughters had some high school education or a high school diploma ($n = 27, 79.4\%$). All daughters had health insurance coverage. A majority of daughters reported being religious or spiritual ($n = 30, 88.2\%$), and Christian ($n = 32, 94.1\%$). Most daughters identified as non-denominational ($n = 10, 29.4\%$), Baptist ($n = 5, 14.7\%$), or Catholic ($n = 5, 14.7\%$). At the time of interviews, only a few daughters had completed the HPV vaccination series ($n = 9, 26.5\%$). Fifteen daughters (44.1%) reported wanting to be HPV vaccinated before age 26 and 10 daughters (29.4%) reported not wanting to be HPV vaccinated at all (Table 4.1).

Perceived Susceptibility

Perceived susceptibility was conceptualized as perceived risk for HPV infection. Few parents perceived daughters to be at risk for HPV infection ($n = 2$, 6.7%). Similarly, no daughters perceived themselves at risk for HPV infection. There was no statistical difference between daughters perceived risk and parents perceived risk for daughters' HPV infection (Table 4.2). Table 4.2 describes parents and daughters perceptions towards the HBM constructs. The primary reason parents and daughters reported not perceiving a risk for HPV infection was belief in daughters' lack of sexual activity and belief in the religious doctrine of no pre-marital sex. Only two daughters reported being sexually active in this study. Daughter's lack of perceived risk for HPV infection and their concern about potential HPV vaccination side effects made them believe HPV vaccination was unnecessary. For example, one daughter said: "I feel like it's not worth it to have a vaccine that you're most likely not even going to get the virus. To have a vaccine for something that has that many side effects like nausea, fainting, dizziness..." Another daughter reported:

I don't know. If I started having sex I would jump to it. But right now I'm just like I don't want to get a shot. I'm not doing anything. I don't like getting shots. I don't like needles. But it's definitely something I would think about being sexually active.

Perceived Severity

Perceived severity was conceptualized as perceiving HPV infection and its health outcomes (genital warts and cervical cancer) as severe. All parents ($n = 30$, 100%) and most daughters ($n = 31$, 93.9%) perceived getting HPV infection as severe, and subsequently getting genital warts and cervical cancer as severe. There was no statistical difference between parents and daughters perceived severity of HPV infection (Table 4.2). Parents and daughters described getting HPV infection as being severe in two ways: (1) an HPV infection would signal to parents

that daughters were sexually active, and (2) an HPV infection would put daughters at risk for developing genital warts and cancers. One parent said:

It would be super serious because it would mean that she's sexually active and that would rock our world completely and so I guess we would have to deal with that shock and then deal with the fact that she's sick you know there's this illness now.

One daughter said:

Basically getting it [HPV] would mean you have to have done something you shouldn't have done in the first place. Well for my household that's how it goes. So that wouldn't be good for me to get it cause then it would just kind of show that I did something that I wasn't supposed to do.

Perceived Benefit

Perceived benefit was conceptualized as perceiving HPV vaccination as effective in preventing HPV infection, genital warts and cervical cancer. More daughters ($n = 29$, 87.9%) than parents ($n = 20$, 66.7%) perceived HPV vaccination as beneficial, however this difference was not statistically significant (Table 4.2). Parents perceived benefit of HPV vaccination focused on their belief that HPV vaccination was effective in preventing HPV infection, genital warts and cervical cancer. Although some parents believed HPV vaccination was beneficial, parents varied on perceiving HPV vaccination can prevent HPV infection, genital warts and cervical cancer. One parent who believed HPV vaccination to be beneficial said:

I want her to know about the different affects HPV might have. Because like I say, you know a lot of women in my family they didn't do stuff like this or get themselves together and you know some of them passed with cervical cancer and other little things.

Another parent said:

Just for the benefit of it, knowing people that had had the genital ... I completely identify HPV with the genital warts because that's what I know of it. I don't know anybody that's had cervical cancer but in my mind just thinking she needs to get this because that will be one thing that she can't catch when she does become sexually active.

One daughter described her perception of HPV vaccination:

I think this vaccine is more effective than like the flu shot. I mean you can get the flu shot and you can still get sick so I just assumed that because like it was something as serious as cancer that it should be more effective.

Parents who varied on their belief that HPV vaccination was beneficial in preventing HPV infection, genital warts, and cervical cancer reported that the HPV vaccination was too new for them to know if it was effective. For example, one parent said: “See I’m not sure yet because of those pieces of information I don’t have. I don’t know if it covers enough strains to be a value.” Another parent said,

Who’s to say if I give it to her and she gets another type of HPV? I mean we all have that virus somehow, you know but I have to do my research. I have to really do my research on that. As a health care provider I know I should be the one to decide for my daughter and my family but I’m still not convinced.

Perceived Barriers

Perceived barrier was conceptualized as any perceived factor that prevents HPV vaccination. Seventeen parents (56.7%) and 11 daughters (34.4%) reported experiencing a perceived a barrier to HPV vaccination acceptance (Table 4.2). The perceived barriers to HPV vaccination acceptance reported by parents were concerns about side effects (infertility, developing cervical cancer), safety, newness of vaccine, effectiveness, daughters being too young, over-medication of children, vaccinating children with an STD vaccine and mistrust of political figures advocating HPV vaccination. Other barriers parents reported included not having enough information about HPV and HPV vaccination, a lack of resources (health insurance, pharmacies not having HPV vaccination available), a pre-existing health condition, and having a negative experience with a HCP. One parent described her concerns about side effects:

When we were in high school, we had the fast girls. You know were doing any and everything and these girls are still alive and don’t have cancer. So it’s just not registering to me why you should subject yourself to a vaccine especially when you’re talking about your reproductive organs, which could you know, maybe a girl have a bad reaction and

then she can't have children or whatever. It's just a bit much and how much information out there is on it.

Another parent described that seeing the Governor of Texas advocating mandatory HPV vaccination made her mistrust the vaccine even more because she didn't feel he was a suitable person to be marketing HPV vaccination. This parent said:

And then when you had a certain person trying to make it mandatory that also was kind of a negative because the person was associated with different points of view and perspectives than I had. So when he kind of became a spokesperson per se or the person that came to mind to be someone mandating, it didn't seem like it was a good thing. If it had come from someone maybe less polarizing it probably would have gone over better or someone from like health and human services, or someone like that, it probably wouldn't have been negative.

Other parents described lacking health insurance at the time the HPV vaccine was offered to their daughter, and pharmacies not having HPV vaccination in stock as barriers to acceptance. For example, this parent said: "The doctor wrote a prescription. She was supposed to go to the pharmacy [to be HPV vaccinated] and we went to like five pharmacies and then couldn't get the vaccine."

The perceived barriers to HPV vaccination reported by daughters were concerns about HPV vaccination side effects, safety, and low knowledge about HPV and HPV infection. The side effects daughters reported being concerned about included experiencing pain from injection and developing cervical cancer. For example, one daughter said:

I was thinking that the doctor should work on it more to try and help like the side effects or try to prevent some of the side effects from happening, so like the fainting, swelling, pain whatever. I would feel better about getting it if the doctors would make a vaccine without those same side effects.

Cues to Action

Cues to action were conceptualized as events, people, or things that motivated parents and daughters to accept HPV vaccination (Table 4.3). Table 4.3 presents cues to action described by parents and daughters. Among parents, the most frequently reported cues to action were receiving a HCP recommendation ($n = 10$, 33.3%), wanting preventing cervical cancer ($n = 10$, 33.3%) and STD/HPV ($n = 8$, 26.7%), and having more education on HPV and the HPV vaccine ($n = 8$, 26.7%). One parent also described other cues to action such as HCPs being more inclusive of parents in conversations about daughters' health history ($n = 1$, 3.3%), while two parents said that HCPs should provide advanced notice of HPV vaccine prior to appointments ($n = 2$, 6.7%). One parent described what would motivate her to accept HPV vaccination for her daughter:

She's sixteen now. When they do the regular routine checkup they put me out the room. So you want me to consent for these things but then you put me out the room. So I'm not even privy to what the conversation is and that's an issue for me. You want me to give parental consent but you put me out the room and then you got that patient/physician confidentiality. And if she puts on the form notice of privacy practice that she don't want mommy to know what they discussed, they can't tell me. If you can't tell me and I'm paying this absorbent insurance premium, I need to know what we talking about and what's being discussed. That's just how I feel.

Another parent described what would motivate her to accept HPV vaccination:

I wish they'd give it [literature on HPV] to you before they give you the shot instead of after.... I say give it to you before you come in to that appointment so that you know exactly what your child is getting and what's in it. You know like a lot of doctors they'll give you the shot and after they give you the vaccine they'll give you the literature on it – no I needed to know this beforehand so that I could tell you yes or no, or she's allergic to this, that's in there, you can't give this to her.

Among daughters, the most frequently reported cues to action were cervical cancer prevention ($n = 10$, 32.2%), STD/HPV prevention ($n = 9$, 29.0%), and parents making the HPV vaccine decision for them ($n = 9$, 29.0%), and acceptance in anticipation of becoming sexually

active ($n = 4$, 12.9%). One daughter described the importance of her parents making the HPV vaccine decision for her:

One daughter described initiating sexual activity as a cue to action:

I feel like if you are sexually active you should get it but if your parents know that you are a little risky around the edge, I think you should get it at nine because you need to just be safe and careful. So like we have this friend she has had like so many boyfriends or whatever so I feel like she should probably get it just to be safe because you don't want her to end up with a disease or cancer.

Self-Efficacy

Self-efficacy was conceptualized as belief in the ability to obtain HPV vaccination if desired. The majority of parents ($n = 29$, 96.7%) perceived the ability to get their daughters HPV vaccinated if they decided. Only two daughters (7.1%) perceived themselves able to be HPV vaccinated if they decided. This difference in self-efficacy among parents and daughters was statistically significant ($p < .001$). This difference is not surprising considering that adolescent females are unable to receive HPV vaccination without parental consent. One daughter said:

I had wanted to get the vaccine after hearing that my friend had gotten cancer but it still doesn't make a difference because it's up to my parents ultimately and I feel like even after the age of twenty-one or whatever I'll still listen to them. I just feel like they're more knowledgeable and they understand it more than me so I just like listen to them even if I have my own opinions and beliefs on a situation.

Discussion

This study explored the health beliefs of African-American parents and daughters towards HPV vaccination. Based on the HBM, African-Americans parents beliefs towards HPV vaccination are characterized as a) low perceived susceptibility for daughters getting HPV; b) high perceived severity of HPV infection and its health outcomes; c) variations in perceived benefits of HPV vaccination preventing HPV; d) perceived barriers focused on concerns about HPV vaccine side effects, lack of HPV information, lack of HPV vaccine provisions in

pharmacies, mistrust of HPV vaccine due to its politicization and mandates, a negative experience with a HCP; and, e) high self-efficacy. Daughters' beliefs towards HPV vaccination are characterized as a) low perceived susceptibility to getting HPV; b) high perceived severity of HPV infection and its health outcomes; c) high perceived benefits of HPV vaccination preventing HPV; d) barriers focused on side effects such as pain, and developing cervical cancer; and, e) low self-efficacy. Cues to action among parents and daughters varied.

African-American parents and daughters had low perceived susceptibility to HPV infection (Gilkey et al., 2014; Rand et al., 2011). Regardless of daughters' age, parents held the belief that daughters were not at risk for HPV due to the belief that daughters were not sexually active. Similarly, daughters expressed that they would consider getting HPV vaccinated when they become sexually active and perceived themselves at risk for HPV infection. While only two daughters reported being sexually active, research demonstrates that within one year of becoming sexually active, more than 25% of all females may acquire HPV infection from their first partner (Winer et al., 2005). This study's finding of African-American parents and daughters having low perceived susceptibility to HPV infection is consistent with previous studies where African-Americans parents and daughters did not think they needed HPV vaccination, until after daughters became sexually active (Hull et al., 2014). It is critical for parents and daughters to understand that a lack of sexually activity is not an indicator that HPV vaccination is unwarranted, but instead indicates the most opportune time for daughters to be HPV vaccinated.

Consistent with the HPV vaccine acceptance literature, a majority of parents and daughters in this study perceived HPV infection and its health outcomes as severe (Brewer & Fazekas, 2007). Interestingly, our findings also identified significant implications that an HPV infection had for this population. Among African-Americans, an HPV infection not only had

clinical implications but social implications as well. Specifically, parents and daughters perceived an HPV infection to signal that daughters could potentially develop genital warts and cervical cancer, but even more, it signaled that daughters had broken their parents' trust and expectation by becoming sexually active when they were taught otherwise. Parents reported teaching their children not to have sex before marriage and daughters reported having this same belief. Our findings support that African-American parents and daughters understand the seriousness of an HPV infection, and demonstrates that for this population, it is not only has clinical implications, but a personal implications as well. It may be worthwhile for future intervention studies to focus on the cultural meanings that influences African-American parents and daughters HPV vaccine acceptance to improve vaccination uptake.

The perceived benefits of HPV vaccination varied between parents and daughters. More daughters than parents perceived HPV vaccination as beneficial. Daughters' and parents' perceived benefits of HPV vaccination was focused on its cancer prevention benefits, and STD prevention benefits. Current HPV awareness campaigns that focus on the cancer prevention benefits of HPV vaccination may indeed be successful in raising awareness and acceptance of HPV vaccination among African-American parents and adolescent girls, despite the numerous misinformation and negative political and media coverage that the HPV vaccine has received since FDA approval (Blasi, King, & Henrikson, 2015). Parents perceived benefits of HPV vaccination seemed to be based on knowing people who had experienced HPV or genital warts, and viewing HPV vaccination as a preventive measure for daughters to avoid that experience. On the other hand, daughters perceived benefits was based on a general belief that vaccinations were important to maintaining a healthy lifestyle, and the belief that a vaccine for something as serious as cancer should be more effective than vaccines for infectious diseases. Our findings suggest

that future HPV vaccine interventions should continue focusing on the vaccines cervical cancer prevention benefits.

It has been over ten years since the FDA approved the HPV vaccine for use in the U.S., yet parents and daughters continue to report experiencing barriers to HPV vaccine acceptance. Concerns about safety and side effects such as infertility, developing cervical cancer, and death, are well documented (Allen et al., 2012; Blackman et al., 2013; Dorell et al., 2014) and continue to persist for African-Americans regardless of research showing HPV vaccination was effective in reducing the prevalence of HPV infection in adolescents (Markowitz et al., 2013), and there being no such association found in the HPV vaccine acceptability literature (Holman et al., 2014). Parents also had a concern about over-medicating children, and whether numerous vaccinations could potentially have negative consequences on daughters' development. Educational interventions should consider focusing additional attention on these areas for this population.

Sexuality related concerns were also reported as a barrier to parents HPV vaccine acceptance (Allen et al., 2010; Brawner et al., 2012; Dorell et al., 2014; Dorell, Yankey, Santibanez, & Markowitz, 2011; Hull et al., 2014; Joseph et al., 2012), in that parents did not believe a vaccine that prevented a sexually transmitted disease was appropriate for children. This was based on parents and daughters' religious beliefs that daughters would not be sexually active until marriage. Essentially, for African-Americans who held this belief, an HPV vaccination was in direct conflict with this belief and became a barrier to their HPV vaccination acceptance. Our finding supports that HPV vaccination is influenced by religious factors for some African-Americans and should be targeted in culturally sensitive HPV vaccination interventions developed for this population.

Other barriers to HPV vaccination acceptance that African-Americans reported were a lack of information on HPV and HPV vaccination, a lack of resources, and having a negative experience with healthcare provider. Parents and daughters reported that although they had heard of HPV and the HPV vaccine, they did not feel that they knew enough information to make a decision about HPV vaccination acceptance. A lack of information about HPV and HPV vaccine is one of the most common barriers to HPV vaccine acceptance among African-Americans (Dorell et al., 2011; Hamlish, Clarke, & Alexander, 2012). While knowledge is not enough to change health behavior, it is an important factor in HPV vaccination acceptance and is especially important for African-Americans HPV vaccine acceptance (Fazekas, Brewer, & Smith, 2008), especially since this is a reoccurring barrier among this population. Similarly, a HCP recommendation is another important factor in African-Americans HPV vaccination acceptance (Hamlish et al., 2012). As such, a negative experience with a HCP can have negative influences on African Americans acceptance of HPV vaccination by increasing mistrust and doubt regarding HCPs and the HPV vaccine (Allen et al., 2012). Parents also reported not being able to access HPV vaccination due to a lack of health insurance coverage, and local health clinics and pharmacies not having HPV vaccination in stock. The Affordable Care Act and the Vaccine for Children program provides provisions for clinics to stock the HPV vaccine and covers the cost of HPV vaccination to eliminate this barrier however, it seems that there are still some areas that can be improved upon.

Cues to action were identified among parents and daughters. The desire for cervical cancer and sexually transmitted disease/ HPV prevention were frequently reported cues among parents and daughters. A HCP recommendation was also frequently reported among parents as a cue to action, while daughters reported parents being the primary person that motivated their

HPV vaccine acceptance. These cues to action are consistent with findings in other studies (Krawczyk et al., 2015). Interesting, other unique cues to actions were also identified among parents and daughters signaling alternate areas for future research to target. Specifically, parents wanting to be included in conversations about daughter's health status with daughters HCP and parents wanting the vaccine be given to all females regardless of age. Daughters perceived cue to action was if they were already sexually active, sexually active with multiple people, or anticipating sexual activity.

Parents perceived the ability to HPV vaccinate daughters if desired and this perception was reported more often among parents than daughters. Most mothers reported being the primary decision maker for daughters and felt HPV vaccination acceptance was a decision that ultimately they should make. As parental consent is required for adolescence to be HPV vaccinated, our findings of daughters not perceiving themselves able to obtain HPV vaccination if desired may suggest the practical implications for obtaining vaccinations. Parents, and specifically mothers are the primary decision makers for daughters' HPV vaccination and our findings support that daughters continue to defer to their parents advise regarding HPV vaccination. This finding may suggest that intervention studies should not only target parents but also develop strategies for adolescent girls to be able to engage parents in conversations about the HPV vaccine in an effort to increase HPV vaccination acceptance among African-American adolescence females.

Limitations

Participants included adults with daughters between the ages of 12 to 17 years old. We did not explore the attitudes and beliefs among parents and daughters outside this age range who might have different experiences and beliefs towards HPV vaccination. As a result, our findings may only be generalizable to populations who fit these criteria given that there may be secular trends that may also influence behaviors and beliefs towards HPV vaccination. Nevertheless, the

goal of this study was to provide a contextualized understanding of how culture influences the health beliefs of African-American parents and daughters towards HPV vaccination. As such, the study's sampling strategy was theoretically guided to select cases that explored the constructs of the HBM as well as other theoretical categories that emerged from the data. Sampling decisions were not guided by the goal of attaining findings that are generalizable to a target population but instead to answer the research question. The findings of this study provide important information on African-American parents and daughters' attitudes and beliefs toward HPV vaccination acceptance. Additionally, considering discussions on HPV, a sexually transmitted infection, may be considered a sensitive topic for some participants, parents and daughters were interviewed separately to facilitate openness for parents daughters to respond without fear of judgment or future repercussions (Roulston, 2010).

Implications

Future HPV vaccination acceptance interventions targeted towards African-Americans should focus on educating parents and daughters' sexuality related beliefs that produce misconceptions of low risk for HPV infection, while also emphasizing the immediate and long-term benefits of HPV vaccination. Barriers to HPV vaccination also suggest a need for targeted interventions on HPV vaccine knowledge focused on HPV transmission and HPV vaccination safety and effectiveness. Although daughters were the primary focus of this study, HPV vaccination rates among adolescent males are low as well and require attention. Parents reported that their attitudes and beliefs towards HPV vaccination acceptance extended to include sons as well. Future studies should examine whether this study's findings on parents perceptions of HPV vaccination acceptance generalize to fathers and sons. Examining fathers and sons' attitudes and beliefs towards HPV vaccination acceptance using a culturally centered theory, such as the PEN-3, may be beneficial in understanding the nature of their perceptions towards HPV vaccination.

Conclusion

To improve HPV vaccination acceptance among African-Americans, a clear understanding of parents and daughters' health beliefs is necessary. Our findings show that African-American parents and daughters have low perception of risk for HPV infection, perceive HPV infection as serious, perceive HPV vaccination to be beneficial and experience barriers to HPV vaccination acceptance. Interestingly however, regardless of the barriers parents face to HPV vaccination, they still perceive they can obtain HPV vaccination for their daughters. This information may have practical use for practitioners who seek culturally appropriate ways to frame their communication with African-American patients about HPV and the HPV vaccine to increase HPV vaccination acceptance.

Table 4.1. HPV Vaccine Acceptance among Parents and Daughters.

	Parents <i>n</i> = 30		Daughters <i>n</i> = 34	
	<i>n</i>	%	<i>n</i>	%
Would accept HPV vaccine	12	40.0	15	44.1
Would not accept HPV vaccine	10	33.3	10	29.4
Daughter Already HPV vaccinated	8	26.7	9	26.5

Table 4.2. Health Belief Model Constructs by Parents and Daughters.

	Parents n=30		Daughters n=33	
	<i>n</i>	%	<i>n</i>	%
Perceived susceptibility	2	6.7	-	-
Perceived severity	30	100	31	93.9
Perceived barriers ^a	17	56.7	11	34.4
Perceived benefits ^b	20	66.7	29	87.9
Self- efficacy	29	96.7	2	7.1

Note. ^a *n* = 33 daughters. ^b *n* = 28 daughters.

Table 4.3. Cues to Action among Parents and Daughters.

	Parents <i>n</i> = 30		Daughters <i>n</i> = 31	
	<i>n</i>	%	<i>n</i>	%
HCP recommendation	10	33.3	4	12.9
Cancer prevention	10	33.3	10	32.2
STD / HPV prevention	8	26.7	9	29.0
Having more education on HPV and HPV vaccine	8	26.7	-	-
Parent made HPV vaccination decision	-	-	9	29.0
HPV vaccine given to females regardless of age	1	3.3	1	3.3
Personal or family history of cancer or HPV diagnosis	5	16.7	1	3.2
Daughter sexually active / anticipation of sexual activity	2	6.7	4	12.9
Structural factors ^a	2	6.7	-	-
A trusted friends or family recommended HPV vaccine	2	6.7	1	3.2
HCP providing advanced notice of HPV vaccine prior to appointment	2	6.7	-	-
Knowing others who HPV vaccinated daughters	1	3.3	-	-
HCP including parents in discussions on child medical history	1	3.3	-	-
Child being old enough to make HPV vaccine decision	2	6.7	-	-
Gardasil commercial	1	3.3	-	-
Nothing would motivate HPV vaccine acceptance	2	6.7	2	6.5

Note. Participants could have had more than one cue to action. HCP= Health Care Provider; STD= Sexually transmitted diseases; HPV= Human papillomavirus.

^a Structural factors include lack of health insurance, and pharmacies not having HPV vaccine in stock.

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CHAPTER 5: SYNTHESIS OF FINDINGS AND IMPLICATIONS

Findings and Implications

This dissertation was conducted to address the inadequate number of studies in the HPV vaccine acceptability literature that examine the role of culture on African-American parents and daughters HPV vaccine acceptance. Specifically this dissertation: 1) systematically reviewed the HPV vaccine acceptance literature to examine how culture was examined among the two largest racial and ethnic groups in the United States: African-Americans and Latinos; 2) Used grounded theory techniques and quantitative methods to identify and explore the cultural factors that influenced African-American parents and adolescent females HPV vaccine acceptance according to the PEN-3 cultural model; and, 3) Used grounded theory techniques and quantitative methods to explore how African-Americans culture influenced parents and adolescent females' health beliefs towards the HPV vaccine according to the HBM. Although African-Americans were the focus of this dissertation, the review included Latinos because both ethnic groups are disproportionately burdened by cervical cancer.

Summary of Findings

Manuscript 1: Parental acceptance and uptake of the HPV vaccine among African-Americans and Latinos in the United States: A literature review

Manuscript 1 is a literature review that condenses the research findings of studies conducted with African-Americans and Latinos on factors associated with HPV vaccine acceptability and uptake. Standards for conducting an integrative review described by Whittemore and Knafl (2005), and Cooper (2009) were used. PubMed, Cumulative Index to

Nursing and Allied Health Literature, and PsycINFO databases were searched up to January 2015.

This review found that few studies assessed the influence of culture on African-Americans HPV vaccine acceptance. Awareness about HPV and the HPV vaccine varied by parents' demographic characteristics. Among African-Americans, higher socioeconomic status was indicative of increased awareness. Sexuality-related concerns, concerns about safety and low perceived risk of daughter's acquiring HPV emerged as barriers to vaccination among African-Americans Latinos. African-Americans acceptability varied more widely than Latinos and acceptance was associated with awareness, perceived risk of acquiring HPV, religion, and a provider's recommendation. For Latino parents, acculturation to U.S. culture and awareness were associated. However, findings were mixed regarding the direction of association between acculturation and knowledge. Vaccine acceptability among Latinos was associated with the vaccine's cancer prevention benefits and a provider's recommendation. Future research should be informed by culture-centered theories, as this is the first step to inform the development of culturally-grounded interventions.

Manuscript 2: A cultural perspective of perceptions, enablers, and nurturers that promote and prevent African-American parents' and daughters' HPV vaccination acceptance

Manuscript 2 reports the finding of a qualitative study to understand the role of culture on African-American parents and daughters' HPV vaccination acceptance using the PEN-3 cultural model. Grounded theory techniques and quantitative descriptive statistics were used to explore the cultural factors that influenced the HPV vaccine acceptance among African-American parents ($n = 30$) and daughters ($n = 34$) residing in the Southeastern and Northeastern U.S.

Among parents and daughters, positive attitudes and beliefs that promoted HPV vaccination focused on the HPV vaccine having cervical cancer and STD prevention benefits,

being safe, and that all girls should be HPV vaccinated. Negative attitudes and beliefs focused on concerns about safety, side effects, newness of the vaccine, and concerns that initiation of the vaccine forces parents to engage in conversations about sex during pre-adolescent years. For a majority of parents and daughters, HPV vaccination acceptance was viewed as separate from their religious beliefs. Parents' HPV vaccine acceptance was based on the information they received about HPV and a moral obligation to protect their daughters. Similarly, daughters reported that their HPV vaccine acceptance was based on what they believed would protect them from diseases. For a minority of parents and daughters however, HPV vaccination acceptance was a decision intertwined with their religious beliefs, and based on individuals' lifestyle choices. This study also indicated that parents and daughters used their support networks when deciding whether to accept HPV vaccination. The type of support that they received was mixed in that it promoted and prevented HPV vaccine acceptance. Particularly, parents and daughters received advice that was not always based on accurate information but based on fears, mistrust, and mixed messages from the media. Although a majority of parents reported growing up in households where topics such as sex and health were not discussed, communication between parents and daughters about sex and health emerged as promoting HPV vaccination acceptance. Parents also reported dissatisfaction with the quality of HCP communication about HPV as preventing HPV vaccination acceptance.

This study supports the role of culture among African-Americans' HPV vaccination acceptance and identifies relevant cultural factors among parents and daughters. Understanding the diverse factors that contribute to African-American parents' and daughters' HPV vaccination acceptance may inform the development of culturally appropriate interventions that advances the field of cervical cancer prevention research.

Manuscript 3: The influence of culture on African-American parents' and daughters' health beliefs towards HPV vaccine acceptance

Manuscript 3 reports the findings of the influence of culture on African-American parents' and daughters' health beliefs towards the HPV vaccine according to the HBM. Grounded theory techniques and quantitative descriptive statistics were used to explore the cultural factors that influenced African-American parents' ($n = 30$) and daughters' ($n = 34$) HPV vaccine acceptance. Participants resided in urban and rural areas of New York City and North Carolina.

Most parents did not perceive daughters to be at risk for HPV infection ($n = 28, 93.3\%$). Most daughters ($n = 33, 100\%$) also did not perceive themselves at risk for HPV infection. The primary reason parents and daughters reported not perceiving risk for HPV infection was belief in daughters' lack of sexual activity and belief in the religious doctrine of no pre-marital sex. A majority of parents ($n = 30, 100\%$) and most daughters ($n = 31, 93.9\%$) perceived getting HPV infection as severe, and subsequently getting genital warts and cervical cancer as severe. This was due to their belief that (1) an HPV infection would signal to parents that daughters were sexually active, and (2) an HPV infection would put daughters at risk for developing genital warts and cancers. Interestingly, more daughters ($n = 29, 87.9\%$) than parents ($n = 20, 66.7\%$) perceived HPV vaccination as beneficial, however this difference was not statistically significant ($p = .07$). Both parents (56.7%) and daughters (34.4%) reported experiencing perceived barriers to HPV vaccination acceptance. Parents perceived barriers focused on concerns about side effects (infertility, developing cervical cancer), safety, newness of vaccine and low knowledge about HPV and the HPV vaccine. Daughters perceived barriers focused on concerns about HPV vaccination side effects (pain, developing cervical cancer), safety, and low knowledge about HPV and the HPV vaccine. Parents' cues to action involved receiving a HCP recommendation,

desiring to protect daughters from cervical cancer and STD/HPV, having more information about HPV and the HPV vaccine. Other cues to action less frequently noted in the literature included being included in conversations about daughters health, and getting prior notice about HPV vaccine before the appointment. Cues to actions reported by daughters included wanting to protect themselves from cervical cancer and STDs/HPV, and in anticipation of becoming sexually active. Self-efficacy was significantly higher among parents ($n = 29$, 96.7%) than daughters ($n = 2$, 7.1%) ($p < .001$).

Strengths and Limitations

There were several strengths and limitations to this dissertation. The characteristics of studies included in the literature review were based on how closely the study objective was conceptually relevant to the review's objective and the racial/ethnic makeup of the study samples containing solely African-Americans or Latinos, or some combination of African-Americans, Latinos or non-Hispanic whites. Importantly, the studies in this review were selected based on their content instead of their methodological rigor and reliability. Another limitation is that the designs of the studies in this review were primarily quantitative cross-sectional, secondary analyses or qualitative descriptive. These designs are low in the level of control that the researcher exerts in the study. Therefore, further studies of more rigorous designs may be needed to identify causal pathways (Brink & Wood, 1997). Regardless of these limitations, an important strength of this systematic literature is that the findings will help guide future research on HPV vaccine acceptability that is conducive to designing of impactful interventions to promote the HPV vaccine among African-Americans and Latinos.

Another limitation to the qualitative aspects of the dissertation is that the coding of data was conducted by one rater. Having more than one rater would have provided opportunities to evaluate intercoder reliability on separate occasions to confirm categories and themes that

emerged from the data (Campbell, Quincy, Osserman, & Pedersen, 2013). However, the analysis was strengthened by being grounded theoretically. The constructs of the PEN-3 model guided analysis and provided a preliminary coding scheme for emergent themes within the data. The participants in this dissertation were primarily African-American mothers and daughters, and therefore, the findings may not be generalizable to other ethnic groups, fathers or sons. Nevertheless, participants in this study reflected an ethnically, and socio-economically diverse group of African-American parents and daughters with cultural roots from the Southern United States, Africa, and the Caribbean. Additionally, daughters were in varying stages of the HPV vaccination process, which allowed for the exploration of similarities and differences among the perspectives of adolescent girls who had initiated or completed the HPV vaccination to adolescent girls who had not initiated the HPV vaccination. This provided valuable information about how specific cultural factors influenced HPV vaccination across the vaccination continuum.

Implications in Research and Practice

Research on the role of culture on African-Americans acceptance of HPV vaccination is as timely as it is necessary. The healthcare literature is shifting from primarily focusing on social determinants of health (i.e. race, gender, income, education) to also focusing on the role of culture on health outcomes. A significant marker of this shift in focus is the recently published National Institutes of Health's report "The Cultural Framework for Health." This report provides the first standardized definition of culture and provides strategies to assess and operationalize culture in health behavior research to address disparate health outcomes among ethnic minority populations (Kagawa-Singer, Dressler, George, & Elwood, 2015). This is facilitated through a tool (the Process Flow Map of questions) that helps researchers identify which aspects of culture may help to drive good or poor health outcomes, with the aim of capturing an accurate view of

cultural factors to produce findings that can be generalized to populations in similar circumstances (American Psychological Association, 2015). Hence a more comprehensive view of culture requires understanding the social, historical and environmental contexts that influences the individual's beliefs and health outcomes. This will ultimately produce a comprehensive view of culture to help researchers understand why certain health disparities continue regardless of the plethora of research aimed to address it. This is indeed an exciting time to conduct research on the influence of culture on health.

The findings in this dissertation further support the need for culture to be explored in health behavior research among African-Americans. Our study shows that aspects of African-American culture are important to parents and daughters HPV vaccination acceptance and should be considered when developing culturally appropriate HPV vaccination interventions. Consistent with the PEN-3 cultural model, which provided the cultural lens to view African-American parents and daughters HPV vaccine acceptance, the next step in this research is to return to the population to present and confirm the study findings. This step is located within the PEN-3's Cultural Identity domain, which is the final and most important domain of the model. Together, the researcher and the population being studied will determine the point of entry for which the intervention that is developed should be targeted. This will either be at the level of the Person, Extended family, or Neighborhood. Engaging the population to actively take a role in addressing the problem of low HPV vaccine acceptance is an empowering and necessary step in developing a culturally appropriate intervention that is applicable to this population.

In this light, future research should examine the effects of a multi-level and multi-generational educational and communications interventions inclusive of parents, adolescent males and females, and support network members on decreasing misinformation and negative

attitudes and beliefs about HPV vaccination. Expanding the scope of focus to include the perspectives of adolescent males may likely contribute to our understanding of how attitudes and perceptions towards HPV vaccination are transmitted generationally and influence the health behaviors and health beliefs of adolescent males within their families and support networks. Although cervical cancer is the most common HPV-associated cancer, HPV is also associated with other cancers, such as anal and oropharyngeal cancers, for which African-American males are amongst those at highest risk for developing them (CDC, 2014a; CDC, 2014b). Thus necessitating more studies that explore HPV vaccination acceptance among African-American males and females. Future research should also examine appropriate strategies for introducing new cancer health technologies (i.e. HPV vaccine) to African-Americans; strategies for improving the quality of HCPs and African-American patients' HPV communication skills about sex, health, and HPV vaccination; and, strategies for promoting African-American parents and daughters communication about sensitive topics such as sex, health, and HPV. Having the input of African-American parents, daughters, and support network members while designing an HPV vaccine intervention for this population may alter the way HCPs and researchers approach the problem of low HPV vaccine initiation and completion. For example, our study found that social support networks provided advice on HPV vaccination acceptance that was not always based on facts but on feelings. Including support network members in interventions with HCPs may help to educate and reinforce the benefits of HPV vaccination while providing a platform for addressing areas of mistrust towards the HPV vaccine. As HCPs and researchers acknowledge that an individuals' health beliefs and health behaviors are a consequence of complex social, cultural and environmental factors, African-Americans' low HPV vaccination acceptance may no longer be viewed from a deviant perspective but from a perspective where HCPs and

researchers understand the strengths of African-Americans and work within those strengths to address this health disparity.

Conclusion

This dissertation contributes to the HPV vaccine literature by addressing a current gap in the HPV vaccine acceptance literature and providing valuable information on the role of culture among African-American parents and daughters HPV vaccine acceptance. This study supports the importance of culture on African-Americans HPV vaccine acceptance. Several cultural factors were identified among parents and daughters that may provide avenues for future interventions to target in designing culturally appropriate interventions for this population. Culturally empowering factors that were identified among African-American parents and daughters included support of vaccinations in general, having positive attitudes towards HPV vaccine, believing in the benefits of HPV vaccination and the severity of an HPV infection, valuing HCP HPV vaccine recommendation, and communication about sex and health. Cultural factors that both positively and negatively influenced HPV vaccination acceptance among African-American parents and daughters were social support networks. Cultural factors that negatively influenced HPV vaccination acceptance among parents and daughters were negative attitudes towards HPV vaccination, religious beliefs, and dissatisfaction with the quality of HCP HPV vaccine recommendation.

This study also support the use of theoretical frameworks centered on culture, such as the PEN-3 cultural model, to study the health behavior of racial/ethnic populations with rich history and experiences that shape their perception of health and medical technology. Future studies should consider using a culturally centered theoretical approach when engaging racial/ethnic populations to better understand their medical decisions, in addition to vaccination decisions.

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